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THESIS

A Synopsis of
Acquisition Related
Topics

by

Jerry F. Hetherington

March 1983

Thesis Advisor: John R. Bergquist

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logistics management. A broad introduction/definition is given in the initial "discussion" section of each topic for a quick review. Individual topics are generally confined to three to four pages to provide an overview of the topic and mention related concepts. The depth of coverage in each topic should be sufficient for a working knowledge of the concept in relation to negotiation, cost analysis or other aspects of the acquisition field. A list of "references for further study" is supplied at the end of each topic as an initial step toward a more in-depth study of the subject matter or for application of the concept to the area of concern.

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A Synopsis of Acquisition Related Topics

by

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Commander, Supply Corps, United States Navy
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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
March 1983

ABSTRACT

Managers and potential managers in the acquisition field should find this thesis to be a useful tool. It initiates development of a single reference that will provide a synopsis of current, important topics relevant to federal acquisition. Individual topics are divided into the following categories: contracting and general acquisition; legal; finance, economics and accounting; production; and logistics management. A broad introduction/definition is given in the initial "discussion" section of each topic for a quick review. Individual topics are generally confined to three to four pages to provide an overview of the topic and mention related concepts. The depth of coverage in each topic should be sufficient for a working knowledge of the concept in relation to negotiation, cost analysis or other aspects of the acquisition field. A list of "references" and a "bibliography for further study" is supplied at the end of most topics as an initial step toward a more in-depth study of the subject matter or for application of the concept to the area of concern.

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I. INTRODUCTION

The Federal Government spends over $150 billion annually in the direct purchase of property and services from the private sector. Federal acquisition is accomplished by more than 130,000 employees through greater than 20 million procurement actions a year. Two statutes provide the foundation for the entire framework of Government contracting and the authority for issuing regulations. The Armed Services Procurement Act of 1947 applies to the procurement activities of the Department of Defense (DOD), the National Aeronautics and Space Administration (NASA), and the Coast Guard. Titles II and III of the Federal Property and Administrative Services Act of 1949, as amended (the Federal Property Act), generally govern the purchase activities of civil agencies. In addition to the two basic procurement statutes, over 4,000 other legislative provisions directly affect or impinge upon the acquisition process. The field of acquisition is also affected by material from a number of related disciplines. Most of the subjects dealing with acquisition are available in voluminous acts or regulations or in a multitude of separate and distinct writings, books and periodicals. Federal and related commercial acquisition executives do not have a single reference at the present time to provide them with a brief synopsis on a topic of concern and a list of references for more in-depth study if so desired.

The purpose of this thesis is to initiate development of a single reference that will provide a synopsis of current and important topics relevant to federal acquisition. The term "initiate" must be emphasized in that a synopsis of all the current and important topics related to the acquisition field is beyond the scope of an individual thesis effort. Rulings by the Armed Services Board of Contract Appeals (ASBCA) and the United States Claims Court (USCC) impact the field of acquisition management on almost a daily basis as do changes in commercial business practices, government regulations and the economic environment. As with any other reference manual, this thesis will need to be updated and supplemented on at least an annual cycle in order to retain its value.

The term "acquisition" shall be used in this thesis in place of the term "procurement". Procurement is to be considered synonymous with "contracting" as a subset of the acquisition functions. "Acquisition" means the acquiring by contract with appropriated funds of property or services by and for the use of the Federal Government through purchase, lease, or barter, whether the property or services are already in existence or must be created, developed, demonstrated, and evaluated. Acquisition includes such related functions as determination of the particular public need, solicitation, selection of sources, award of contracts, contract financing, contract performance, and contract administration.

The topics selected for initial inclusion and synopsis are divided into chapters under the following headings;

Contracting and other general acquisition subjects

Legal

Finance, economics and accounting

Production

Logistics management

Many of the topics that are included could stand alone as the subject for an in-depth thesis analysis. However, an attempt will be made to condense all topics to a maximum of four pages, not including tables, lists, graphs or charts. The purpose of this limit on the depth of topic coverage is to coincide with the average amount of time that an acquisition executive is expected to have available for a brief overview on a subject that currently has an impact on what he is trying to accomplish. The "references" and "bibliography for further study" included at the end of most topics are by no means considered to be exhaustive. Their purpose is to provide the "next step" to a more concentrated study of a particular topic beyond the first step of the synopsis provided. In all cases the Defense Acquisition Regulation (formerly the Armed Services Procurement Regulation) and other uninterpreted laws or regulations are the most authoritive reference. However, they are not listed individually for each topic in the interest of brevity.

Topics in each chapter are not arranged in order of importance. In fact, because of the number of names or subject classifications attached to some of the topics, they are not even in alphabetical order. Use of this reference will require scanning the topics under the relevant chapter heading for location of the topic identified as an individual section. A topic that has multiple application in the acquisition field such as PERT/CPM, for example, is not included under the normal heading of Production but is included in an area that emphasizes its multiplicity, Logistics Management.

For the purpose of later updates and supplementation, topics, references and prepared synopsized topics should be forwarded to the Acquisition and Contracting Management Academic Associate, Department of Administrative Sciences, Naval Postgraduate School, Monterey, California 93940.

II. CONTRACTING AND GENERAL ACQUISITION SUBJECTS

A. THE DOD ACQUISITION IMPROVEMENT PROGRAM/CARLUCCI INITIATIVES

1. Discussion

Deputy Secretary of Defense Frank C. Carlucci issued a memorandum on "Improving the Acquisition Process" on April 30, 1981. One additional item on "Increasing Competition" was added to the original list of 31 initiatives on July 27, 1981. Since that time, significant changes have been made in the planning, programming, and budgeting system (PPBS) and the acquisition process. However, much remains to be done to fulfill Secretary of Defense Caspar W. Weinberger's promise "to demonstrate to the American taxpayer that we can and will manage our large, complex, and critically needed establishment in a prudent and businesslike manner" [Ref. 1]. The major theme of the changes is to achieve enhanced readiness, reduced acquisition costs and shortened acquisition time.

2. Acquisition Improvement Actions

1) Reaffirm acquisition management principles

2) Increase use of Preplanned Product Improvement

3) Implement multiyear procurement

4) Increase program stability

5) Encourage capital investment to enhance productivity

6) Budget to most likely costs

7) Use economical production rates

8) Assure appropriate contract type

9) Improve system support and readiness

10) Reduce administrative costs and time

11) Budget for technological risk

12) Provide front-end funding for test hardware

13) Reduce governmental legislation related to acquisition

14) Reduce number of DOD directives

15) Enhance funding flexibility

16) Provide contractor incentives to improve reliability and support

17) Decrease DSARC briefing and data requirements

18) Budget for inflation

19) Forecast business base conditions

20) Improve source selection process

21) Develop and use standard operation and support systems

22) Provide more appropriate design-to-cost goals

23) Implement acquisition process decisions

24) Reduce DSARC milestones

25) Submit MENs with service POM

26) Revise DSARC membership

27) Retain USDRE as the Defense Acquisition Executive

28) Raise dollar thresholds for DSARC review

29) Integrate DSARC and PPBS process

30) Increase PM visibility of support resources

31) Improve reliability and support

32) Increase competition

3. Primary Objectives

The 32 acquisition improvement actions are firmly rooted in eight fundamental management principles. These principles were stated by Mr. Vincent Puritano, Executive Assistant to the Deputy Secretary of Defense, in an article in the October 1981 issue of Defense/81 [Ref. 2: pp. 9-19] as follows:

> We must improve long-range planning to enhance acquisition program stability.
>
> Both OSD and the Services must delegate more responsibility, authority and accountability for programs; in particular, the Service program manager should have the responsibility, authority and resources adequate to execute efficiently the program for which he is responsible.
>
> We must examine evolutionary alternatives which use a lower risk approach to technology than solutions at the frontier of technology.
>
> We must achieve more economic rates of production.
>
> We must realistically cost, budget, and fully fund in the Five Year Defense Plan, and Extended Planning Annex, procurement, logistics and manpower for major acquisition programs.
>
> Readiness and sustainability of deployed weapons are primary objectives and must be considered from the start of weapon system programs.

> A strong industrial base is necessary for a strong defense. The proper arms-length relationships with industry should not be interpreted by DOD or industry as adversarial.
>
> Defense managers at all levels should expand their efforts to obtain maximum competition for their contractual requirements.

The publications of DOD Directive 5000.1 [Ref. 3] and OMB Circular A-109 [Ref. 4] were major achievements in the definition and refinement of the acquisition process. Of particular note in both of these documents is the strong emphasis on tailoring the acquisition process to yield the optimum acquisition strategy. In spite of such improvements, however, Mr. Carlucci's view was that in the past too much emphasis had been put on studying problems and too little on implementing solutions. Thus, five working groups were chartered not to conduct yet another study of the acquisition process but to look at solutions that had been proposed in the past and determine a course for future actions. Out of these study groups' findings and recommendations came the 32 actions designed to:

a. promote decentralization and participative management (actions 17, 24, 26, 27 and 28),

b. improve the planning and execution of weapon system programs,

    1) improve ability to cope with technical uncertainties (actions 2, 11, 12 and 15),

    2) improve planning (actions 4, 7, 25 and 29),

    3) improve costing and execution of programs (actions 6, 8, 18, 19, 20 and 22),

c. strengthen the industrial base that supports the Department of Defense (actions 3, 5 and 32),

d. increase the readiness of weapon systems, particularly in the early stages of their lives in the field (actions 9, 16, 21, 30 and 31), and

e. reduce the burdensome administrative requirements that make the acquisition process more costly and time-consuming than necessary (actions 10, 13, and 14).

4. References

1. Brabson, G. Dana "Department of Defense Acquisition Improvement Program." Concepts, Vol. 4, No. 4, Autumn 1981, p. 54.

2. Puritano, V. "Getting Ourselves Together on Systems Acquisition", Defense 81. October, 1981.

3. DOD Directive 5000.1, "Major Systems Acquisitions", March 29, 1982.

4. Office of Federal Procurement Policy. "OMB Circular A-109", Washington, D. C., April 5, 1976.

5. Bibliography for Further Study

Concepts. Vol. 5, No. 3, Summer 1982, pp. 9-213.

B. SOCIO-ECONOMIC INFLUENCES ON ACQUISITION

1. Discussion

A socio-economic program is designed to promote, advance or achieve social benefits through economic and contractual means. While socio-economic programs imposed on the acquisition process can be traced back at least to 1876 (preference for American sources of bunting), the major impetus for the policies was the depression of the 1930s. At present, the Office of Federal Procurement Policy (OFPP) lists forty-six current programs, which are summarized at the end of this synopsis.

An important general area of conflict between acquisition and most socio-economic programs is competition. Socio-economic programs act to limit the competition otherwise available and, in this sense, conflict with acquisition objectives. Through legislation the nation is depending upon federal contracts to further its social objectives, and there is little disagreement about the ends being sought. However, to determine that the means are effective, most experts agree that a cost-benefit analysis needs to be performed on current and future socio-economic programs.

2. Program Impact/Burden

Socio-economic programs represent a multitude of interests and objectives unrelated to acquisition objectives. Therefore, they receive substantial support from protected or benefitted groups but decidedly less support from the program, user and procurement groups whose projects may be made more difficult, expensive or time consuming. Administration of the programs, training personnel in program objectives, requirements and procedures, and imposition of support requirements on contractors all contribute

to the burdens. Socio-economic programs with high perceived burdens have certain common characteristics.

a. Positive action by acquisition personnel is required to accomplish the program.

b. Program actions must be documented to provide proof of compliance.

c. Program actions must be reported to government agencies for statistical consolidation.

d. Performance objectives are established for the specific program.

e. Acquisition actions require coordination with a government agency other than the procuring agency.

3. COGP Recommendations

In 1972 the Commission on Government Procurement (COGP) conducted research on how the acquisition process is employed to accomplish socio-economic goals. It concluded that the cumulative effect of programs already imposed on the procurement process and the addition of those contemplated could overburden it to the point of threatening breakdown. As a result, the COGP made three recommendations which were accepted by both the executive and legislative branches of the Federal Government. These were [Ref. 1: pp. 79]:

a. Establish a comprehensive program for legislative and executive branch reexamination of the full range of social and economic programs applied to the procurement process and the administrative practices followed in their application.

b. Raise to $10,000 the minimum contract value at which social and economic programs are applied to the procurement process.

c. Consider means to make the costs of implementing social and economic goals through the procurement process more visible.

Since publication of the COGP report, the socio-economic program recommendations have not been implemented, except in the case of the Miller Act (refer to paragraph 5. d.).

4. Problems/Recommendations

A major problem is that there is no committee in the Congress with jurisdiction over both procurement and the various socio-economic programs. A potential solution would be to establish a date for a "sunset" type of review for each socio-economic program, develop measurable criteria for evaluating benefits received against costs incurred, plan to modify programs following sunset review if achievements are not satisfactory, and consider setting a time limit for the duration of preferential treatment. Additionally, Congressional leadership should require that oversight committees analyze the impact of new laws (and amendments to current statutes) on the acquisition/procurement process. A separate sub-committee (possibly under Government Operations) should be established in both the Senate and House of Representatives. This sub-committee would be tasked with the responsibility of evaluating the effect of those laws and amendments on other equally important national objectives being advanced through the use of federal contracts and grants. Finally, to improve the effectiveness of implementation of programs that clear the above hurdles, require that all program management and acquisition/procurement personnel attend short

indoctrination briefings on socio-economic programs in effect (including a discussion of the history, goals, philosophy, need, and duration of the program).

5. OFPP Recognized Socio-Economic Programs

Program	Authority	Purpose
a. Socio-economic programs to improve working conditions		
Davis Bacon Act	40 USC 276a-1 to a-5	Minimum wages, benefits, and work conditions for construction contracts
Service Contract Act	41 USC 351-7	Minimum wages, benefits, and work conditions for service contracts
Walsh-Healey Act	41 USC 35-45	Minimum wages, hours and work conditions for supply contracts
Contract Work Hours and Safety Standard	40 USC 328-332	Eight hour day, forty hour week for laborers and mechanics on public works
Fair Labor Standards Act	29 USC 201-19	Minimum wage, maximum hour standards for employees in commerce
b. Socio-economic programs to favor disadvantaged groups		
Small business	15 USC 631-647	Promote contracting with small business

Minority business	15 USC 631-647	Requires contracting and subcontracting with minority firms
Products of blind and handicapped	41 USC 46	Mandatory purchase of products made by blind and handicapped persons
Prison-made supplies	18 USC 4124	Mandatory purchase of certain supplies from Federal Prison Industries
Equal Employment Opportunity	EO 11246 EO 11375	Prohibits discrimination, requires affirmative action
Employment of Handicapped	29 US 793	Affirmative action for handicapped
Labor Surplus Area	PL 95-89 E. O. 12073	Preference to concerns performing in labor surplus areas
Disabled and Vietnam Veterans	38 USC 2012	Affirmative action for disabled and Vietnam veterans
Required source for jeweled bearings	Policy	Preserves a mobilization base for jewel bearings
Indian self-determination and education assistance	PL 93-638	Requires preference to Indian labor and firms in carrying out programs for their benefit

Women business enterprise	EO 12138	Promotes women-owned business

c. Socio-economic programs to favor American companies

Buy American Act	41 USC 10a-d	Provides preference for domestic material
Berry Amendent	Annual Appropriations Act	Restricts DOD from purchase of foreign food, clothing, textiles, and specialty metals
Preference for domestic hand tools	Annual Appropriations Act	Restricts purchase of foreign hand tools
Acquisition of foreign buses	PL 90-500 Sec. 404	Restricts DOD purchase or lease of foreign manufactured buses
Preference for US flag vessels	10 USC 2631	Shipment of goods on US bottoms
Preference for US flag air carriers	PL 96-623	Use of US flag air carriers for personnel
Preference for US products for Military Assistance Programs	22 USC 2354	Requires purchase of US products for MAP
Prohibition of construction of naval vessels in foreign shipyards	Annual Appropriations Act	Prohibits construction of naval vessels or major components in foreign shipyards
Prohibition on purchase of non-US stainless steel flatware	Annual Appropriations Act	Prohibits use of funds for purchase of stainless steel flatware not made in the US

d. Socio-economic programs to protect the environment and quality of life

Care of laboratory animals	PL 91-579	Requires humane treatment of animals in experiments
Humane slaughter of livestock	7 USC 1901-6	Purchase meat only from suppliers who conform to humane standards
Release of product information to consumers	EO 11566	Encourage dissemination of government documents of use to consumers
Recycled material	PL 94-580	Requires contractor certification as to use of recycled materials
Conservation of energy	PL 94-163	Requires consideration of conservation in selecting contractors
Clean air and water	42 USC 1857	Certification and agreement to comply with Act
Occupational Safety and Health Act (OSHA)	29 USC 651-678	Requires contractor compliance with DOL regulation
Restriction on conversion of heating plants in Europe	Annual Appropriations Act	Prohibits use of funds to convert heating plants from coal to oil

Miller Act	40 USC 270a-d	Requires performance and payment bonds on construction contracts
Copeland "Anti-Kickback" Act	18 USC 874 40 USC 276c	Prohibits kickbacks from employees on public works
Maybank Amendment	Annual Appropriations Act	Prohibits payment of differential by DOD to relieve economic dislocation
Covenant against contingent fees	10 USC 2306 41 USC 254	Prevents contingent fee payments

e. Socio-economic programs to achieve other government purposes

Purchases in Communist countries	DOD policy	Prohibit acquisition of supplies for public use from some areas
Balance of Payments	Policy	Reduce effects of overseas purchases on adverse BOP
Excess and near excess currency	Policy	Preference in award to offerers willing to be paid in excess or near excess currency
Non-use of foreign flag vessels engaged in Cuban and North Vietnam trade	Policy	Prohibits shipping any supplies on such vessels

Officials not to benefit	18 USC 43	Prohibits members of Congress from benefitting from any government contract
Gratuities	10 USC 2207	Right to terminate a contract if gratuity was given to government employee to obtain it
Convict Labor Act	18 USC 436	Prohibits employment of convict labor on government contracts
Duty free entry of Canadian supplies	Policy	Further economic cooperation with Canada
Procurement of A & E services	PL 92-582	Precludes price competition for A & E services

6. References

1. Hampton, Richard J. and Lorrette, Richard J. "Socio-Economic Objectives: Impact on Civil and Defense Agencies." *Defense Systems Management Review*. Vol. 2, No. 4, 1979: 79-88.

7. Bibliography for Further Study

McNabb, Dale E.; Olmstead, Kenneth A.; and Smith, William E. "On the Utilization and Degradation of the DOD Acquisition System for Socio-Economic Policy Implementation." *National Contract Management Journal*. Vol. 15, Issue 2, 1982: 21-36.

Sherman, Stanley N. *Government Procurement Management*. Maryland: Wordcrafters Publications, 1981.

Sullivan, Patrick D. "Socio-Economic Program Impact on Acquisition Management." _Defense Systems Management Review_. Vol. 2, No. 4, 1979: 89-98.

C. GOVERNMENT/COMMERCIAL DIFFERENCES IN CONTRACTING

1. Discussion

Public and private procurement are generally similar, particularly with respect to the fundamental solicitation and award processes, but differ in many areas primarily because of the sovereignty of the government and oversight by the public. Buyers and sellers in the private sector are expected to comply with general legal and ethical restraints concerning competitive behavior and prohibitive actions in restraint of trade. Equality between the buyer and seller in private contracting generally exists, with the exceptions of the influences of comparative size, economic strength and technical knowledge. However, the government as a buyer is the rule maker in virtually all circumstances. The government has the capacity to write contract clauses, procurement regulations and management procedures in addition to its size and economic strength. Futhermore, federal procurement includes a much higher proportion of research, research and development, and major systems acquisitions. Significant differences between public and private procurement are discussed in the following subsections.

2. Authority

The government contracting officer must have "express authority", delegated via a written warrant, in order to obligate the government and enter a contract. In commercial contracts, the Uniform Commercial Code [Ref. 1 and 2] identifies "apparent authority", whereby, via the law of agency, a seller acting in good faith may reasonably assume the commercial contracting officer has authority comparable with that of similar agents in similar companies and may hold the buyer's company liable for their agent's

actions. The government may not be held liable unless their agent acted under express authority.

Commercial firms are also subject to interpretations of "implied" and "customary" authority. For example, a firm's president may be held responsible under a condition of implied authority for his actions if the company has hired him to "run the business" or do everything necessary or proper and usual in the ordinary course of business. Additionally, a firm's agent may be held responsible for his actions (and thereby legally obligate his company) under a condition of customary authority if most similar agents in similar companies customarily perform equivalent actions.

3. Socio-Economic Objectives

Government contracts are often used as instruments for meeting social and economic objectives directed by regulation or statute. Examples include the Small Business Act (SBA), the Buy American Act, Occupational Safety and Health Act (OSHA) regulations, and the Full Employment Act which directs buys to Labor Surplus areas.

Though a commercial company may formally or informally pursue corporate social responsiblilties via contractual action, that pursuit is not directed by law. To facilitate tax reporting and substantiation of taxable deductions, a business firm will usually support social and economic programs by direct contributions.

4. Formal Advertising

Government regulations rigidly define agency action in procurements via formal advertising as to method of solicitation, receipt of proposals, irrevocability of bids, formal bid opening, public display of bid abstracts and apparent winner and award. Formal advertising must be used in all cases except where exemption is authorized in

accordance with the seventeen criteria listed in Section III, Part 2 of the Defense Acquisition Regulations [Ref. 3]. The commercial sector utilizes competitive bidding frequently but does not constrain itself to these limitations.

5. Government Reserved Contractual Rights

The government reserves several important rights governing the actions of the contract parties. Clauses that form the "boilerplate" of the contract are not subject to waiver by the contracting officer or to negotiation. In fact, under the "Christian Doctrine", the statutory clauses in government contracts are binding on the contractor regardless of whether or not the clause is actually written or incorporated by reference in the contract. Examples of these clauses include the Changes Clause, which gives the government the unilateral right to direct changes in scope in the contractor's performance; the Disputes Clause, which allows the contracting officer to make final determinations in disputes between parties; and the Terminations Clause, which gives the government the right, unilaterally, to terminate the contract for convenience. These rights exist because of the sovereignty of the government and are not available to the private sector.

6. Contractor Remedies

In commercial transactions contractors may sue for breach of contract or submit a dispute to arbitration, if provided for in the contract. An unsuccessful bidder has no appeal avenue unless there is evidence of fraud.

Contractors have a maze of remedies available to them in the field of government contracting, due mostly to public oversight of government activities. Losers of formally advertised bids may submit a protest to the General

Accounting Office (GAO). Contractors who are not satisfied with a contracting officer settlement may submit a claim to the Armed Services Board of Contract Appeals (ASBCA) or directly to the United States Claims Court (USCC). Additionally, contractors seeking extraordinary relief due to essentiality or damage from a government action may submit a claim under Public Law 85-804 to the Contract Adjustment Board of the applicable service. Even though the contractor has a number of appeals routes available, if the contract work has not been completed, the contractor has no right to cease operations.

7. References

1. Aljian, George W. Purchasing Handbook. McGraw-Hill Book Company, 1973.

2. Uniform Commercial Code--1962: Official Text with Comments. Minnesota: West Publishing Co., 1964.

3. Defense Acquisition Regulations. 1 July 1976.

8. Bibliography for Further Study

Page, Harry R. Public Purchasing and Materials Management. Massachusetts: D. C. Heath and Company, 1980.

Sherman, Stanley N. Government Procurement Management. Maryland: Wordcrafters Publications, 1981.

D. PURCHASING PERFORMANCE MEASUREMENT

1. Discussion

Performance in most areas affecting Government procurement is quite difficult to express in quantitative terms. The validity of standards used must be assessed for each procurement office independently, because they will vary with materials, markets and vendors. A general approach allows performance to be evaluated in the three distinct categories of management effort, buyer proficiency and procurement efficiency [Ref. 1]. Evaluation of management effort includes a qualitative assessment of a number of broad managerial responsibilities, such as the capabilities of personnel, the soundness of the organization structure, purchasing plans, policies, procedures and the adequacy of reports. The evaluation of buyer proficiency is more quantitative and normally is accomplished by matching actual results against standards or targets that have been established as necessary to achieve agency goals. Control of procurement efficiency involves an evaluation of workloads, personnel utilization, operating costs, and processing times as related to specific volumes of purchasing operations. Procurement executives should strive to achieve a high degree of efficiency but not at the expense of buyer proficiency, in that there is a greater opportunity for cost savings through "smart" buying.

2. Objectives

Primary considerations that should be included in establishing an overall performance measurement criterion follow.

a. The criterion should complement the organization's goals and objectives.

b. The criterion should provide adequate feedback so that progress toward accomplishing objectives can be measured.

c. The criterion should be evaluated through trend analysis rather than absolute measurement to reflect the uniqueness of each agency.

d. The criterion should be used as a control device and management tool, and not as an enforcement weapon, in order to preserve its accuracy and to provide a higher quality of critical analysis of the impact of different indicators.

3. Management Effort

An evaluation of management effort is essentially a management audit of the procurement function and could be most accurately accomplished by someone external to the purchasing area. Purchasing management and the designated evaluator should be concerned with the procurement scope, organization, personnel, policies, procedures and reports and records.

The scope of the purchase task is a function of how important management considers procurement in relation to the total operation. The location of the procurement staff in the organizational hierarchy, their participation in the formulation of policy (ie. inventory levels, reciprocity, make-or-buy) and the degree of their involvement in related activities (ie. participation in setting material standards, impact on final value analysis decisions) are indicators of the scope of the procurement function.

The procurement organization must operate at a proper level of authority and responsibility in order to generate concern for minimizing errors and to facilitate the development of pride for a job "well done". In this era of discussion of centralization versus decentralization, it is important to remember that the grouping of operating activities must consider functional operation, coordination and control requirements; and adequate job descriptions should be available. Additionally, organization planning must be a continuing evolution in order to meet future needs.

The evaluation of purchasing personnel is tied to their initial qualifications and the knowledge that is subsequently attained. If compensation levels are too low or the turnover rate is high for some other reason, then the degree of expertise is adversely affected. Selection criteria must be evaluated and job training should be included in the planning and preparation for advancement and replacement of personnel.

The publication and understandability of policies and procedures is the key factor in their evaluation. The mechanization and automation of all areas in procurement should be considered in order to improve efficiency and better utilize assets.

An evaluation of records and reports must make a determination of "too much or too little". When it is determined that records are adequate and properly maintained, their timeliness and meaningfulness to their intended audience must then be ascertained.

4. Buyer Proficiency

A number of different performance factors can be measured to provide a basis for appraising and controlling buyer proficiency. However, depending on the nature of the business and the materials purchased, several factors will

vary in their degree of importance to individual agenc Timeliness, quantity, cost, quality, sources and the l of satisfaction of supported departments are frequently used measures of buyer proficiency.

Purchasing's impact on production, inventory levels, product quality (agency image), and product cost is significant in this age of complexity and specialization. Component and piece-part procurement (increased emphasis on subcontracting) is increasingly being performed by many firms and agencies. As sources for materials are declining, it is incumbent upon the purchasing function to establish good vendor relations and investigate potential alternatives. The buying function of any organization is a service function and, if the departments being served are not satisfied with purchase performance, then proficiency is less than adequate.

5. Procurement Efficiency

Internal purchasing department efficiency is a measure of the appropriate use of available resources. Maximizing the use of resources, though, may be detrimental to buyer proficiency. For example, increasing the number of procurement actions per buyer may have a serious impact on the quality of individual contracts.

Factors that can be compared to the number of buyers include the number of contracts issued, the number of orders placed, the number of modifications necessary, the amount of dollars obligated and departmental operating costs per employee. Additional factors that can be monitored are absenteeism, employee turnover and error rates.

6. Specific Government Criteria

Some of the specific criteria monitored by government agencies are the following:

a. Procurement/Purchase Administrative Lead Time (PALT)--The elapsed time from the purchase request receipt to the placement of the order is a key performance factor that is computed and compared to similar organizations.

b. Workload--The number of completions, work in progress and the backlog are monitored as indicators of service provided.

c. Modifications and changes--The thoroughness of the original buy and the adequacy of the specifications are a factor in the number of modifications and changes required.

7. References

1. Lee, Lamar, Jr. and Dobler, Donald W. Purchasing and Materials Management: Text and Cases. McGraw-Hill Book Company, 1977, pp. 474-486.

III. LEGAL

A. THE TRUTH IN NEGOTIATIONS ACT/P. L. 87-653

1. Discussion

Public Law 87-653 (also known as the Truth in Negotiations Act or the Hebert Act) was enacted in 1962 because Congress feared that contractors were not being fully honest on proposed prices during negotiations with the Government. Lawmakers were concerned that a firm would sign a contract and then find ways to cut its costs and pocket the savings as extra profit. Under the Truth in Negotiations Act, the Government is allowed to charge defective pricing in the original contract and recoup or retain the difference.

The intent of P. L. 87-653 is to guarantee that government negotiators come to the bargaining table with essentially the same information as that possessed by the contractor. This places the government buyer in a fairer bargaining position with the contractor (who, prior to the 1962 enactment, had superior knowledge of actual cost information). The Truth in Negotiation Act is designed to provide a contractual, as distinquished from legal, remedy against contractors who fail to disclose accurate cost and pricing information on negotiated contracts. Prior to the passage of this act, the Government's only recourse was a legal remedy based on fraud.

2. Public Law Requirements

The Act establishes the requirement that, for noncompetitive negotiated contracts or admendments thereto which exceed $500,000, contractors must furnish government buyers complete, accurate, and current data on appropriate costs. Additionally, the Act requires the contractors to certify that, to the best of their knowledge and belief, all cost data furnished are current, accurate and complete. For contracts with a value between $100,000 and $499,999, cost data are required if requested from the contractor. However, they do not have to be certified. Finally, the Act provides that all applicable contracts must contain a clause requiring readjustment of the contract price whenever it can be shown that the contracting data were noncurrent, inaccurate or incomplete. These same requirements apply to the award of a subcontract at any tier, where the prime and each higher tier subcontractor have been required to furnish such a certificate, if the price of such subcontract is expected to exceed $100,000.

The only contracts exempted from this Act are those where the price negotiated is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public or prices set by law or regulation or, in exceptional cases, where the head of the agency determines that the requirements may be waived and states in writing his reasons for such determination. An example of a waiver is in the case of sole source suppliers of critical items (i. e. the oil industry) where all suppliers have refused to sign the Truth in Negotiations forms (DD form 633).

3. Implementation

To achieve the objectives of the Truth in Negotiations Act the acquisition manager must:

a. Utilize the data submitted by the contractor in arriving at a fair and reasonable price,

b. Require the contractor to furnish the required certification after negotiation,

c. Place the appropriate clauses in the contract, and

d. Document the file to assure that the records show whether or not the data submitted were actually relied on by the acquisition manager in negotiations ("track-ability").

The burden of proving price increases caused by defective cost or pricing data rests with the Government. If the contractor refuses to agree to an appropriate price reduction, the Government must establish:

1) That the data submitted by the contractor were noncurrent, inaccurate or incomplete,

2) That the data increased the contract price, and

3) The dollar amount of the increase.

Contracting personnel should keep extensive logs or diaries of negotiation sessions, in the event that the negotiations are later questioned.

For the purpose of evaluating the accuracy, completeness and currency of cost and pricing data submitted in accordance with P. L. 87-653, any authorized representative of the head of the agency who is employed by the Government has the right to perform the review until the expiration of three years after final payment. The reviewer

has the right to examine all books, records, documents and other data of the prime or subcontractor in relation to the negotiation, pricing or performance of the contract or subcontract.

4. Bibliography for Further Study

Lee, Lamar, Jr. and Dobler, Donald W. Purchasing and Materials Management: Text and Casebook. McGraw-Hill Book Company, 1977.

Sherman, Stanley N. Government Procurement Management. Maryland: Wordcrafters Publications, 1981.

B. CONTRACTS ADJUSTMENT BOARD/P. L. 85-804

1. Discussion

Under Public Law 85-804, 50 U. S. Code 1431, Congress has authorized extraordinary contractual adjustments to be made by procuring activities (those authorized by the President to use the act) under limited circumstances. The legislation was originally enacted to facilitate the interests of national defense by providing relief to contractors from certain hardships encountered when contracting with the Government under wartime emergency conditions [Ref. 1]. Contractors may now seek relief under the act because of their essentiality to national defense or because of the detrimental effect of a government action.

Normally, for actions of $50,000 or more, an agency contract adjustment board (chairman and two to six members) considers requests. For actions amounting to less than $50,000, authority may be delegated to the heads of procuring activities. Decisions relating to questions of law may be appealed. For decisions related to questions of fact, however, the boards determinations are final and conclusive and the contractor has no avenue for appeal [Ref. 2]. Actions taken are reported to Congress annually, are matters for public record, and are based on facts and sound judgement. These decisions are administrative [Ref. 3].

2. Essentiality

For relief to be granted under the essentiality provision, a contractor's continued performance on a defense contract or continued operation as a source of supply must be found to be essential to the national defense. What may be required for a determination of "essentiality" will vary from situation to situation and is not bound by prior

determinations. Guidance can be obtained through an analysis of what circumstances have been perceived as giving rise to a determination of essentiality by approving authorities in prior situations.

Where a given source is the only practical way to meet a defense requirement because of time constraints or unavailability of an economical alternative, essentiality may be found, although other sources may otherwise be available (*Environmental Systems Development Corp.*, NCAB (Feb. 14, 1974) 3 ECR #3). However, where "a period of inconvenience and possible short-term slippage...but no long-term adverse effects were anticipated," no finding of essentiality was found (*Astronetics Research, Inc.*, NCAB (Dec. 24, 1964) 1 ECR #197). Generally, if the consequences of not granting relief are acceptable to the government, essentiality will not be found (*Commercial Engineering and Manufacturing Co.*, AFCAB (Feb. 8, 1962) 1 ECR #101). The desirability of having the source available should a future need arise did not give rise to a finding of essentiality (*Montross Chemical Divsion*, ACAB (Dec. 10, 1971) 2 ECR #149).

A finding of essentiality may be limited to current contracts then being performed (*Trad Electronics Corp.*, AF/NCAB (Feb. 6, 1959) 1 ECR #2) or may be based on the resource the company represents to meet future needs (*Latsec, Inc.*, AFCAB (Nov. 25, 1975) 3 ECR #66). Finally, essentiality would not be found where the company does not, in fact, have the capability which is claimed to be essential (*Charles Payne and Associates*, AFCAB (March 1, 1963) 1 ECR #154).

The measure of relief due to essentiality is only limited by the purpose of the relief. That is, to the extent a company were found to be essential, relief could be granted to whatever extent was necessary to retain the

essential source, so long as the funds were available. The cause or extent of a company's loss under a Government contract would be irrelevant.

3. Government Action

The exact nature of "Government action" which may give rise to relief being granted will vary from situation to situation and is not bound by prior determinations. Guidance can be obtained through an analysis of what circumstances have been perceived as giving rise to relief by approving authorities in prior situations.

While an attempt may be made to characterize the Government action as either contractual or sovereign, this may be difficult and, then, the characterization may not even be determinative (Check's Maintenance Service Company, Inc., ACAB (March 19, 1962) 2 ECR #80). However, it is recognized that the Government may take action in the market place, which action has an effect on a particular contractor and yet is not the type of Government action which will support a granting of relief (Cochran Western Corp., ACAB (May 3, 1977) 3 ECR #92). Further, the Government action must be the cause of a loss by the contractor.

Generally, the contractor must have been placed in the position of suffering an unavoidable loss due to action taken by the Government after contract award and in its role as the other contracting party. Losses which are "essentially the result of business risks voluntarily undertaken" will not support relief under this provision (Coastal States Petroleum Co., NCAB (Jan. 7, 1972) 2 ECR #153).

Relief granted because of "Government action" is limited to actual loss under the contract and does not extend to a loss of profits.

4. References

1. Air Force Institute of Technology. *Contract Administration*. Vol. 1, Chapter 11, 1980, pp. 139.

2. Federal Acquisition Institute. *Principles of Government Contract Law* Washington, D. C.: U. S. Government Printing Office, Sept. 1979.

3. Sherman, Stanley N. *Government Procurement Management*. Maryland: Wordcrafters Publications, 1981, pp. 48-49.

5. Bibliography for Further Study

Seller, B. R. "Creative Energy Corporation", M. S. case (unpublished), Naval Postgraduate School, 1979.

IV. FINANCE, ECONOMICS AND ACCOUNTING

A. FINANCIAL CAPABILITY OF POTENTIAL SOURCES

1. Discussion

One of the goals of acquisition management is material delivery in a timely manner. The firm's capability of being responsive is partially a function of adequate financing or the ability to acquire financing. A pre-award survey or independent financial analysis is necessary in order to estimate the strength of the firm throughout the contract period, to verify with creditors their willingness to provide additional funding if necessary and/or the necessity for the government to provide working capital.

2. Evaluation

A review of a company's financial position may show that a contractor has ample financial strength or show such an extreme weakness that the company should not be considered for an award. To estimate the financial capability of a firm, procurement personnel can make use of past relationships and selected ratios, tempered by their best judgement of changes in future conditions. Some quantitative figures that should be considered for review are:

Trends in

Gross margin ratio

Sales

Debt/equity ratio

    - Return on investment
    - Cash flow/debt
- Working capital needs
    - Current ratio
    - Quick or acid-test ratio
    - Accounts receivable/payable turnover
    - Inventory turnover

Some qualitative items that should be considered for review are:

- Credit ratings
- Notes to financial statements
- Market share
- Capital asset stability (lease expirations, age, etc.)

3. Pre-Award Surveys

Most of the information above can be gathered during the pre-award survey (DD Form 1524-3 of the survey package is pertinent to financial capability). The factors to be considered in ascertaining whether a firm is responsive/responsible are:

a. adequate financing,

b. ability to meet delivery and specifications,

c. satisfactory record of performance,

d. satisfactory record of integrity,

e. necessary organization, and

f. necessary facilities and equipment.

The type of evaluation required to determine supplier capability varies with the nature, complexity, and dollar value of the purchase to be made. For more complex, high-dollar-value purchases the factors to be appraised are the adequacy of equipment, production control, quality control and cost control; the competence of technical and managerial staffs; the morale of personnel in general; the quantity of backorders; the willingness of the plant to handle the buyer's orders and work cooperatively with his organization; and the quality of the key materials management activities. Investigation of financial statements and credit ratings can reveal whether a vendor is clearly incapable of performing satisfactorily. Financial stability is essential for suppliers to assure continuity of supply and reliability of product quality. Financially strong firms are usually, although not always, managerially strong also.

4. Working Capital

Contractors are responsible for financing their working capital needs during performance of the contract but seek to reduce capital needs through payments. As part of its effort to encourage competition and to provide the broadest possible competitive basis for its procurement, the government has adopted a policy of providing financial assistance in connection with its contracts. The basic objective is to support procurement and production and to foster small business by providing necessary funds to enable contractors to perform. Government financing should be provided only to the extent that it is reasonably required for prompt and efficient performance. Furthermore, it is not ordinarily authorized for purposes other than the working capital needs of the contractor. It normally is precluded where the purpose is to allow facilities expansion by a contractor.

A contractor's ability to secure working capital from financial institutions without government aid is enhanced by the Assignment of Claims Act of 1940. This statute enables government contractors to assign their claims for payment under federal contracts to banks, trust companies or other financial institutions. Government payments are made directly to the lender, thereby increasing assurance of loan repayment.

5. Government Financing

There are four methods by which the government provides contractors with working capital. Listed in their order of preference by the government, they are: customary progress payments, guaranteed loans when authorized, unusual progress payments, and advance payments.

The preferred method, customary progress payments, is normally authorized when lead time from contract award to first delivery is six months or more (four months for small business). For large commercial firms the payment may equal 85% of the total costs incurred or 90% of the cost of labor and materials (90% and 95%, respectively, for small businesses) but may be a smaller percentage at the discretion of the agency.

Although not used extensively in peacetime, contractors involved in the national defense may be authorized to use a guaranteed loan. Under the guaranteed loan procedure, a financing institution lends the needed funds directly to the contractor only after the loan is guaranteed by the government. The loan is guaranteed through the Federal Reserve Board on the authorization of the procuring activity and a fee is charged for this service.

Next in order of preference, a contractor may be authorized to use unusual (or flexible) progress payments. When this is done, the government allows either a payment in

excess of the percentage limitations (stated above) for customary progress payments or a shorter lead time than required for customary progress payments or both.

The least preferred method of government financing is the advance payment plan. This method of financing differs from the other techniques in that funds are paid into a special bank account in advance of performance. The contractor pays contract accounts by drawing checks on the special bank account. The primary uses of advance payments are for financing research or research and development contracts with nonprofit educational institutions and for the management and operation of government-owned plants.

6. Bibliography for Further Study

Air Force Institute of Technology. *Contract Administration*. Vol. 1, Chapter 9, 1980, pp. 115-126.

Bowlin, Oswald D.; Martin, John D.; and Scott, David F. *Guide to Financial Analysis*. McGraw-Hill Book Company, 1980.

Gibson, Charles H. "How Industry Perceives Financial Ratios." *Management Accounting*, Vol. LXIII, No. 10, April 1982, p. 13.

Helfert, Erich A. *Techniques of Financial Analysis*. Illinois: Richard D. Irwin, Inc., 1982.

Thompson, A. J. and Strickland, A. A. *Strategy and Policy*. B. P. I., 1981, pp. 8-19.

B. WEIGHTED GUIDELINES FOR PROFIT

1. Discussion

To achieve consistency in rewarding contractors, via profit, for their effort, risks, investment and other special factors in performing government contracts, a set of standards was necessary. The uniform, systematic approach entitled "weighted guidelines" is generally required for DOD negotiators when cost analysis is used in arriving at a negotiated agreement on contract price. Weighted guidelines are a method of establishing profit objectives which promise higher or lower rewards, depending on the difficulty of the contract task, the skills assigned to perform the task, the cost risks assumed, facilities used and other factors in the absence of adequate competition. In addition to being used for new contractual agreements, weighted guidelines can be used in situations where the establishment of the profit objective has a retroactive effect, such as in the conversion of a letter contract, in retroactive price redetermination and in the negotiation of some change orders.

When using the weighted guidelines method, it must be remembered that it is a technique for analysis, evaluation and establishment of a profit objective. Therefore, it is used as a tool for negotiation but is not an object of negotiation itself. The contractor's proposal should include cost information for evaluation and a total profit figure. Contractors should not be required to submit the details of their profit objectives, but they should not be prohibited from doing so if they desire. If the difference between the contractor's profit objective and the contracting officer's profit objective is relatively small, no discussion of individual factors may be necessary. If

the negotiating parties' objectives are relatively far apart, a disclosure of weightings and rationale by both parties may be made concerning the total assigned to contractor effort, contractor risk, facilities investment, and special factors. By a mutual understanding of the logic of the respective positions, an orderly progression to final agreement should result.

2. Purpose

To maintain a strong defense effort in a free enterprise economy, the best business capabilities must be attracted to defense work. Since profit is generally the primary motivating force of business firms, the challenge facing the Department of Defense is to utilize the profit motive to stimulate efficient and economical contractor performance. For each contract in which profit is negotiated as a separate element of price, the goal should be a contractual arrangement that provides high rewards for exceptional performance. Profit policy is an integral part of pricing policy, and the profit policy is implemented by the use of weighted guidelines.

When cost analysis is performed, profit consideration should be in accordance with the objectives set forth below [Ref. 1]. The Government should establish a profit objective for contract negotiations, which will

a. motivate contractors to undertake more difficult work requiring higher skills and reward those who do so;

b. allow the contractors an opportunity to earn profits commensurate with the extent of the cost risk they are willing to assume;

c. motivate contractors to provide their own facilities and financing and to establish their

competence through development work undertaken at their own risk and reward those who do so; and

d. reward contractors for productivity increases.

The weighted guidelines method for establishing profit objectives is designed to provide reasonably precise guidance in accomplishing the above principles. This method, properly applied, will tailor profits to the circumstances of each contract in such a way that long-range cost-reduction objectives will be fostered and a range of profits commensurate with varying circumstances will be achieved for all contractors.

3. Exceptions

Under the following circumstances, other methods for establishing profit objectives may be used:

a. Architect-engineering contracts;

b. Management contracts for operation and/or maintenance of Government facilities;

c. Construction contracts;

d. Contracts primarily requiring delivery of material supplied by subcontractors;

e. Termination settlements;

f. Cost-plus-award-fee contracts;

g. Contracts not expected to exceed $500,000; and

h. Unusual pricing situations where the weighted guidelines method has been determined to be unsuitable. Such exceptions shall be justified in writing and shall be authorized by the head of the contracting activity.

If the contracting officer makes a written determination that the pricing situation meets any of the circumstances set forth above and that application of the weighted guidelines will result in an inequitable profit objective, other methods for establishing the profit objective may be used. These methods shall be supported in a manner similar to that used in the weighted guidelines (i.e., by a profit factor breakdown and documentation of profit objectives). However, investment or other factors that would not be applicable to the contract shall be excluded from the profit objective determination. It is intended that the methods will result in profit objectives for noncapital intensive contracts that are below those generally developed for capital intensive contracts [Ref. 1].

4. Weight Ranges

The current weight ranges (percentages) for the factors to be considered in cases for which profit is to be specifically negotiated are included in the Defense Acquisition Circular #76-23 of 26 February 1980 and listed in the following table [Ref. 1].

	Manufacturing	R&D	Services
CONTRACTOR EFFORT			
Material Acquisition			
Subcontract items	1-5%	1-5%	1-5%
Purchased parts	1-4	1-4	1-4
Other material	1-4	1-4	1-4
Engineering			
Direct labor	9-15	9-15	N/A
Manufacturing			
Direct labor	5-9	5-9	N/A
Services			
Direct labor	N/A	N/A	5-15
Overhead	N/A	N/A	4-8
Other			
General Management	6-8	6-8	6-8
CONTRACTOR RISK	0-8	0-7	0-4
FACILITIES INVESTMENT	16-20	N/A	N/A
SPECIAL FACTORS			
Independent development	1-4	1-4	N/A
Other	*	*	*
Productivity	**	N/A	N/A

*range of -5 to +5%

**some percentage of cost reduction

5. Reporting

A "Report of Individual Contract Profit Plan" (DD Form 1499) must be prepared by the contracting office for each negotiation of a contractual agreement involving a separate cost and profit that together total $500,000 or more. The form and associated contract files are to be submitted within 10 days of the end of the month of action

to individual service activities in accordance with the *Defense Acquisition Circular* #76-23 [Ref. 1].

6. *References*

1. *Defense Acquisition Circular*. Number 76-23, 26 February 1980.

7. *Bibliography for Further Study*

Air Force Institute of Technology. *Contract Administration*. Vol. 1, Chapter 4, 1980.

Defense Acquisition Circular. Number 76-23, 26 February 1980.

Defense Acquisition Regulations. 1 July 1976, paragraph 3-808.2-6.

Government Contracts Reporter. *Armed Services Procurement Regulation Manual for Contract Pricing*. Illinois: Commerce Clearing House, Inc., 1975.

C. CAS 403/ALLOCATION OF HOME OFFICE EXPENSES TO SEGMENTS

1. Discussion

The purpose of this Cost Accounting Standard is to establish criteria for the allocation of the expenses of a home office to the segments (business units) under its control. Allocation from segments and reallocation of a segment's share of home office expenses to contracts and other final cost objectives is covered by CAS 410/Allocation of Business Unit General and Administrative Expense to Final Cost Objectives.

Cost Accounting Standard 403 establishes a hierarchy of allocation techniques based on the beneficial or causal relationship between home office expenses and the receiving segments. These relationships are divided into three categories as presented in the following three subsections [Ref. 1].

2. Direct Expenses

Expenses incurred for specific segments should be allocated directly to those segments to the maximum extent practical.

3. Indirect Expenses with Objective Allocation Bases

Expenses incurred for various segments and whose relationship to those segments can be measured on some objective basis should be grouped in logical and homogeneous expense pools and allocated on the most objective basis available. Four identified categories of these expenses are centralized service functions, staff management of certain specific activities of segments, line management of particular segments or groups of segments and central payments or accruals. The Standard sets forth a hierarchy of allocation

techniques and suggests several types of allocation bases for this second category of home office expenses. The methods or techniques suggested support the thrust of the Standard, which requires that home office expenses shall be allocated on the basis of the beneficial or causal relationship between supporting and receiving activities. The hierarchy of allocation techniques can be summarized as follows:

a. A measure of the activity of the organization performing the function. Supporting functions are usually labor-oriented, machine-oriented, or space-oriented.

b. A measure of the output of the supporting function, in terms of the units of end product produced.

c. A measure of the activity of the segments receiving the service.

4. Residual Expenses

Residual expenses are those which are incurred to manage the organization as a whole and have no identifiable relationship to any specific segment or segments. The aggregate of such expenses must be allocated to segments either (1) on the basis of a three-factor formula or (2) on any basis representative of the total activity of the segments. The three-factor formula is required when total residual expenses exceed stated proportions of the aggregate operating revenues of all segments for the previous fiscal year, as follows:

3.35% of the first $100 million
0.95% of the next $200 million
0.30% of the next $2.7 billion
0.20% of all amounts over $3 billion

5. Three Factor Formula

The three factor formula is considered to result in appropriate allocations of the residual expenses of home offices [Ref. 2]. It takes into account three broad areas of management concern: the employees of the organization, the business volume, and the capital invested in the organization. The percentage of the residual expenses to be allocated to any segment pursuant to the three factor formula is the arithmetical average of the following three percentages for the same period:

a. The percentage of the segment's payroll dollars to the total payroll dollars of all segments.

b. The percentage of the segment's operating revenue to the total operating revenue of all segments. For this purpose, the operating revenue of any segment shall include amounts charged to other segments and shall be reduced by amounts charged by other segments for purchases.

c. The percentage of the average net book value of the sum of the segment's tangible capital assets plus inventories to the total average net book value of such assets of all segments. Property held primarily for leasing to others shall be excluded from the computation. The average net book value shall be the average of the net book value at the beginning of the organization's fiscal year and the net book value at the end of the year.

6. Sources of Controversy

The primary contractor complaint about CAS 403 is that it is overly rigid with respect to residual expenses. The Boeing Company appealed to the Armed Services Board of Contract Appeals (ASBCA) a contracting officer's decision on their "head count allocation method" for state and local taxes (1977). The appeal was denied on the basis of a lack of causal or beneficial effect for the allocation, as was a motion for reconsideration by Boeing. Interpretation No. 1 (45 Federal Register 13721, 3/3/80) clarifies CAS 403 in regard to state and local income taxes by directing that the fraction allocated to segments must be calculated pursuant to a formula prescribed by the state statute on the fraction of total corporate income subject to tax. Many other disputes are in process concerning the inapplicability of the three factor formula in all circumstances.

7. References

1. Aerospace Industries Association of America, Inc. _A Compendium of Cost Accounting Standards' Impact Upon The Procurement Process_. Washington, D. C., 1979.
2. _Cost Accounting Standards Guide_. Commerce Clearing House, Inc., 1978.

8. Bibliography for Further Study

Aerospace Industries Association of America, Inc. _Summary Analysis: Second Evaluation Conference Cost Accounting Standards Board_. Washington, D. C., 1978.

D. CAS 409/DEPRECIATION OF TANGIBLE CAPITAL ASSETS

1. Discussion

The purpose of Cost Accounting Standard 409 is to provide criteria for assigning costs of tangible capital assets to cost accounting periods and for consistent allocation of those costs to cost objectives. The standard is based on the concept that depreciation should be a reasonable measure of the expiration of service potential of the tangible assets subject to depreciation. Standard 409 does not require the use of any specific method of depreciation. However, CAS 409 does tend to favor activity and straight-line methods. The method employed for financial accounting must be used unless that method does not reasonably reflect expected consumption of services or the method is unacceptable for Federal income tax purposes. The Board in its prefatory comments stated [Ref. 1]:

> It is not the intent of the board to introduce uncertainty into contract negotiation and settlement by encouraging challenge of contractors' depreciation methods. If the method selected is also used for external financial reporting and is acceptable for income tax purposes, the Board's expectation is that it will be accepted.

2. Promulgation History

The Cost Accounting Standards Board sought to achieve a practical degree of uniformity and consistency in fixed asset depreciation accounting techniques with this cost accounting standard. However, CAS 409 was the first standard not approved unanimously by the Board. Mr. Charles A. Dana, the Board's one industry representative, dissented and his subsequent resignation from the Board has frequently

been attributed to his fundamental disagreement with this promulgation. Additionally, the proposed standard was revised and republished in the Federal Register after initial adverse responses to its publication were received.

Even with the promulgation of CAS 409, the controversy was not ended. A new Cost Accounting Standard does not become effective as soon as it is promulgated. It may be rejected by a joint resolution of both houses of the Congress within sixty days of continuous session after the date of promulgation. To date, no such joint resolution has ever been passed. However, committees of both the Senate and the House of Representatives did hold hearings on CAS 409, with a view toward determining whether it might impose an unreasonable burden on the defense industry. No action was taken by either house, however; and the Standard did become effective as law---but only after a long and controversial process. And the controversy has still not died. [Ref. 2].

3. Records to Support Service Lives

The service lives of assets (their expected periods of usefulness) must be supported by records of past retirement or withdrawal from active use for like assets. However, past experience may be modified. Factors that can be used for modification include both changes in expected physical usage, such as changes in the quantity and quality of output, and changes in expected economic conditions, such as technical or economic obsolescence. If the required records are not available when the requirements of the standard must first be followed, the information must be developed from current and historical fixed asset records and be available following the second fiscal year after that date. If special circumstances warrant, a shorter estimated service life of an asset may be negotiated by the

contracting parties if a shorter life can be reasonably predicted. Assets for which the contractor has no available data or prior experience must be assigned a service life based on a projection of expected usefulness; however, that service life cannot be less than the asset guideline period (mid-range) published by the Internal Revenue Service. Use of any such alternative lives must cease as soon as a contractor can develop service lives supported by its own experience.

The Board recognized that for some companies additional costs would be incurred to implement the standard and the one-time analytical effort. However, it was their contention that these administrative costs, when reasonably managed in light of the purpose to be served, were warranted by the likelihood of better measurement of depreciation cost than was previously available.

4. Sources of Controversy

Industry's initial complaints about CAS 409 centered around longer write-off periods for assets and the additional record keeping required. It was argued by industry that such requirements would result in prolonged cost recognition, ignore the economic realities of inflation, provide little incentive for companies to contract with the Government because of the Standard's impact on earnings and cash flow, and erode the productivity of Government contractors.

Studies to date have shown that there has been no major financial impact associated with the implementation of CAS 409 [Ref. 2 and 3]. However, there is no clear indication of how much overhead rates have increased because of possible additional administrative costs and what the attendant increase in the costs of Government contracts have been.

Differences in the length of the write-off periods used for tax and contract costing purposes were recently increased with passage of the Economic Recovery Tax Act of 1981. The accelerated cost recovery system (ACRS) defines four categories of capital assets, with cost recovery allowed over periods of 3, 5, 10, and 15 years---much shorter times than previously allowed. Industry believes that disputes in negotiations have increased in number, and attempts to alter the Cost Accounting Standards will continue to be made [Ref. 3].

5. References

1. *Cost Accounting Standards Guide*. Commerce Clearing House, Inc., 1978.

2. Kline, Jack C. and Fremgen, James M. "The Impact of Cost Accounting Standard 409 on the Defense Industry". *National Contract Management Journal*. Vol. 15, Issue 2, Winter 1982.

3. Aerospace Industries Association of America, Inc. *A Compendium of Cost Accounting Standards' Impact Upon the Procurement Process*. Washington, D. C., 1979.

6. Bibliography for Further Study

Mosier, Andrew P. "Enhancing Productivity Through Increased Capital Investment". *Concepts*. Vol. 5, No. 3, Summer 1982, pp. 197.

E. CAS 410/ALLOCATION OF G & A TO COST OBJECTIVES

1. Discussion

Cost Accounting Standard 410 (Allocation of Business Unit General and Administrative Expenses to Final Cost Objectives) provides criteria for the identification and allocation of costs pertinent to the overall management and administration of a business unit on a beneficial or causal relationship. The Cost Accounting Standards Board's objectives in promulgating this Standard were to limit general and administrative expenses to those related to the general management and administration of the business unit as a whole and to require their allocation by a base that measures the total activity of the business unit during a cost accounting period [Ref. 1]. As with the other cost accounting standards, the Board also sought to increase the objectivity and comparability of cost data [Ref. 2].

Originally proposed in September 1974, a revised proposal was issued in September 1975. It included two alternative methods for transition from a cost of sales allocation base to a cost input base. A variation of one of the alternatives was ultimately selected for the final version of CAS 410 in April 1976 and included a method for record transition.

Some of the major aspects of CAS 410 are:

a. The general and administrative expense pool must be allocated to final cost objectives by means of a cost input base, either on a total cost input, a value-added cost input, or a single element cost input basis (in descending order of preference) as is most appropriate in the circumstances.

b. The practice of maintaining separate pools for selling and marketing expense, independent research

and development expense (IR&D), bid and proposal expense (B&P) and general and administrative expense may continue or the contractor may combine them, if they are all properly allocated over the same base. IR&D and B&P costs are the subject of Cost Accounting Standard 420.

c. Items produced for inventory must be included only once in the computation of the general and administrative allocation base for the period in which they are produced. G & A expenses may be allocated to that inventory either in the period in which it is produced or in the period in which it is used in final cost objectives. This aspect of the Standard is covered in detail in reference 3.

d. General and administrative expenses are narrowly defined to include only such expenses for general management and administration which have no directly measurable relationship to particular cost objectives.

2. General and Administrative Expense Definition

General and administrative expense is defined as any management, financial, and other expense incurred by or allocated to a business unit and which is for the general management and administration of the business unit as a whole [Ref. 3]. G & A expense does not include those management expenses that can be more directly allocated by a base other than a cost input base representing the total activity of a business during a cost accounting period. A business unit's general and administrative expenses are to include the following home office expenses allocated to it in accordance with CAS 403:

a. Costs allocated directly for the management of the specific segment.

b. Line management costs allocable to more than one segment, and

c. Residual expenses.

Home office centralized service functions, staff management of specific activities of segments, and central accruals, however, must be allocated to the appropriate cost objectives of the segment on the basis of a beneficial or causal relationship. Only if no such relationship is identifiable can these expenses be included in the segment's G & A expense pool.

3. Cost Input Allocation Bases

CAS 410 prohibits the use of a sales or cost of sales allocation base for G & A expenses. The Standard authorizes the use of three cost input bases and the one selected should best represent the total activity of a typical cost accounting period.

a. A total cost input base is generally acceptable as an appropriate measure of the total activity of a business unit. Cost input includes all expenses which are not in the G & A expense pool and are not part of a combined pool of G & A expenses and other expenses allocated using the same allocation base.

b. Value-added cost input is proper when inclusion of material and subcontract costs would significantly distort the relationship of expenses to benefits received. A value-added base is total cost input less material and subcontract costs.

c. A single element cost input base, such as direct labor, is proper when it reflects total activity better than either of the two previous methods.

4. Transition to the Cost Input Base

A business unit using a cost of sales or sales base prior to the effective date of the Standard or prior to accepting a CAS covered contract may choose to use the transition method set out in Appendix A of the Standard. The transition method is optional, however; a business unit may choose to proceed with an immediate changeover to the use of a cost-input base for allocating G & A to all cost objectives and seek equitable adjustments under pre-existing contracts.

5. Sources of Controversy

Industry complaints about CAS 410 center around the belief that the Standard is overly rigid in its guidelines, does not consider generally accepted accounting principles (GAAP) in its requirement for use of a cost input base and complicates negotiations. The Defense Contract Audit Agency (DCAA) and the Council of Defense and Space Industry Associations (CODSIA) have petitioned the CASB for interpretations in the areas of government furnished material (GFM), inter-segment transfers, and the use of the value-added and single-element cost input bases in order to avoid litigation. In response to both organizations, the CASB replied that the Standard and further information provided by the DOD CAS Working Group paper 78-21 (DOD WG 78-21) were sufficient and a formal interpretation was not required.

6. References

1. Aerospace Industries Association of America, Inc. *A Compendium of Cost Accounting Standards' Impact Upon the Procurement Process*. Washington, D. C., 1979.
2. Anderson, Lane K. and Smith, Howard G. "Understanding Cost Accounting Standard 410", *National Contract Management Journal*. Vol. 15, Issue 2, Winter 1982.
3. *Cost Accounting Standards Guide*. Commerce Clearing House, Inc., 1978.

F. CAS 414/INTEREST COST ON FACILITIES CAPITAL

1. Discussion

Cost Accounting Standard 414 (Cost of Money as an Element of the Cost of Facilities Capital) establishes criteria for the measurement and allocation of the cost of capital committed to facilities (i. e., imputed interest on the investment in those facilities) as an element of contract cost. Until 1976, the Department of Defense did not recognize interest as an allowable contract cost. CAS 414 provides for the explicit recognition of the cost of money for facilities capital. The Department of Defense coordinated changes in profit policy and cost principles with promulgation of the Standard and provided for recognition of facilities investment in reaching a pre-negotiation profit objective under the weighted guideline method. Now contracts negotiated with the use of cost analysis include consideration in both cost and profit of interest on facilities and major equipment investment. The purpose of this consideration is to:

a. Reward contractors for facility investments.

b. Motivate increased productivity and reduced costs through the use of modern manufacturing technology.

c. Recognize the impact of fluctuating interest rates.

d. Provide for consistency and facilitate comparisons between firms as regards the amount of investment required to adequately perform Government contracts.

2. Requirements

The amount of contractor investment in facilities to support contract performance and the actual cost of money to finance that investment must be determined. The total facilities capital (both tangible and intangible capital assets) associated with each indirect cost pool is first identified, and then an imputed interest cost for this amount is allocated to contracts on the same basis as those indirect costs.

The actual cost of money for a contractor is hard to determine. A firm's capital structure usually includes bank loans, corporate stocks, and corporate bonds. The cost of money for the firm for each of these is probably different from the others, and different bond issues or loans will likely have different interest rates. Further, the cost of stockholders' equity is an imputed interest rate, CAS 414 adopted the rate determined by the Secretary of Treasury pursuant to Public Law 92-41 as the cost of money for all contractors. The rate is established semi-annually (June 30 and December 31) and published in the Federal Register. It approximates the interest rate on new commercial loans maturing in five years.

3. Procedures

The contractor is responsible for developing, as a part of the cost proposal, an estimate of the Facilities Capital Cost of Money for each proposed contract. To do this, the contractor develops Facilities Capital Cost of Money Factors through the use of the Cost Accounting Standards Board-Cost of Money Factors (CASB-CMF) form and then uses these factors to determine the Facilities Capital Cost of Money for an individual proposal.

To assist in the application of objective Cost of Money Factors to the contracts, the Government has developed DD Form 1861 (Contract Facilities Capital and Cost of Money). Through use of this form, the purchasing office can determine the applicable Facilities Capital Cost of Money for each burden center and sum them to find the objective Facilities Capital Cost of Money for the contract.

Profit on facilities investment is based upon the Facilities Capital Employed on the contract. In addition to determining the Cost of Money, the purchasing office must determine the imputed value of capital employed on the contract for the purposes of the profit objective. Since the total cost of money is determined by multiplying the imputed cost of money rate by the net book value of assets, the value of assets employed on a contract can be determined by dividing the contract Cost of Money by the same money rate. This value for Contract Facilities Capital Employed is entered in line 17 of the Weighted Guidelines Profit Objective form (DD Form 1547) and assigned an appropriate profit weight (currently 16% to 20%), in accordance with the Weighted Guidelines.

4. Sources of Controversy

Industry complaints about CAS 414 initially centered around the manner of handling research and development expenses, bid and proposal expenses, and interest costs for capital assets under construction. Cost Accounting Standards 417 (Cost of Money as an Element of the Cost of Capital Assets Under Construction) and 420 (Accounting for Independent Research and Development Costs and Bid and Proposal Costs) served to clarify these issues.

More recently, in times of high and rapidly fluctuating interest rates, industry complaints with CAS 414 have been concerned with the shortfall between the Treasury

promulgated interest rate and the rate that contractors must pay on their temporary and long-term equipment and building borrowings. Late Government progress payments of two to four weeks or more cause vendors to have a "substantial" investment in receivables and inventories in order to satisfy contract performance requirements. This temporary investment is believed to have a draw-down effect on the funds available for capital assets.

5. Bibliography for Further Study

Aerospace Industries Association of America, Inc. A Compendium of Cost Accounting Standards' Impact Upon the Procurement Process. Washington, D. C., 1979.

Cost Accounting Standards Guide. Commerce Clearing House, Inc., 1978.

V. PRODUCTION

A. THE MAKE OR BUY DECISION

1. Discussion

A firm's objective is to arrive at make-or-buy decisions whose composite effect maximizes the utilization of its productive, managerial, and financial capabilities. The contractor has the basic responsibility for make-or-buy decisions. Therefore, the contractor's recommendations should be accepted unless they adversely affect the Government's interests (i.e. represent the high cost alternative) or are inconsistent with Government policy (i.e. potential subcontractor has been debarred or suspended). Governmental monetary and fiscal policies are external factors that may influence make-or-buy decisions.

2. Contractor Changes to the Make-or-Buy Program

In a going concern, past managerial decisions establish the current operating pattern. Within a particular operational pattern, make-or-buy investigations can originate in one of several ways. The development of a new product or the substantial modification of an old one is a typical situation requiring a make-or-buy investigation. Unsatisfactory supplier performance for parts originally purchased is a second situation that gives rise to make-or-buy investigations. Occasionally a firm's value analysis program uncovers a purchased part whose cost is

disproportionate to its value. Periods of significant sales growth or sales decline also generate situations that initiate make-or-buy analysis. The tendency toward "make" decisions in order to stabilize production and work force fluctuation is usually greater in small firms than in larger ones [Ref. 1: pp. 314]. The make-or-buy decision can also be influenced by the labor relations climate within a firm. However, any changes to a previously negotiated make-or-buy program must be approved in writing by the contracting officer.

3. Categories of Make-or-Buy Decisions

Make-or-buy analysis, when viewed in a broad sense, can be grouped in two general categories. The first category includes parts for which the using firm currently possesses the necessary major production potential. With only a small capital outlay for tooling and minor equipment, the firm can make each of these parts. The second category includes parts which the using firm cannot produce in its existing operations without a sizable additional investment in tooling and facilities. Any "make" alternative requiring a significant capital investment becomes a matter of basic product determination, because it is directly related to long-range company objectives and financial plans.

4. Considerations Which Favor Making a Part

a. Cost considerations (less expensive to make the part)

b. Desire to integrate plant operations

c. Productive use of excess plant capacity to help absorb fixed costs

d. Need to exert direct control over production and/or quality

e. Design secrecy required

f. Unreliable sources

g. Desire to maintain a stable workforce (in periods of declining sales)

5. Considerations Which Favor Buying a Part

a. Suppliers research and specialized know-how

b. Cost considerations (less expensive to buy the part)

c. Small volume requirements

d. Limited production facilities

e. Desire to maintain a stable workforce (in periods of rising sales)

f. Desire to maintain a multiple-source policy

6. Requirements

As a general guideline, the make-or-buy program should not include items or work efforts costing less than one percent of the total estimated contract price or $500,000, whichever is less [Ref. 2: pp. 131].

Information with respect to prospective contractors' make-or-buy programs is required in negotiated procurements except:

a. when a proposed contract has a total estimated value of less than $1 million, unless the contracting officer specifically determines that such information is appropriate,

b. in research and development contracts, unless the contract is for prototypes or hardware and it can reasonably be anticipated that significant

follow-on quantities of the product will be procured,

c. when the contracting officer determines that the price is based on adequate price competition, on established catalog or market prices of commercial items sold in substantial quantities to the general public, or on prices set by law or regulation, or

d. when the contracting officer determines that the work is not complex.

The prospective contractor must furnish the following with the proposed make-or-buy program:

a. a description by which each major item can be identified,

b. a recommendation to make or to buy each such item or defer the decision,

c. a list of the proposed subcontractors, if known, including location and size classification,

d. designation of the plants or divisions in which the contractor proposes to make the item, including whether the facility is in or near a section of concentrated unemployment or underemployment, and

e. sufficient additional information to permit the contracting officer to evaluate the proposed program.

The make-or-buy programs, as approved by the contracting officer, normally are included only in cost-reimbursement contracts. Even for cost reimbursement contracts, there are exceptions:

a. applicable cost-sharing contracts,

b. applicable cost-plus-incentive-fee (CPIF) contracts, and

c. incentive contracts to which the price adjustment provisions are applicable.

7. References

1. Lee, Lamar, Jr. and Dobler, Donald W. Purchasing and Materials Management: Text and Cases. McGraw-Hill Book Company, 1977.

2. Air Force Institute of Technology. Contract Administration. Vol. 1, Chapter 10, 1980, pp. 130-132.

8. Bibliography for Further Study

Gansler, Jacques S. The Defense Industry. Massachusetts: The MIT Press, 1980.

Office of Management and Budget. "OMB Circular A-76." 1979.

B. PRE-PLANNED PRODUCT IMPROVEMENT

1. Discussion

The concept of Pre-Planned Product Improvement (P^3I) involves the orderly, time phased introduction of incremental system capability to accommodate projected changes in threat or to reduce risk in initial fielding of a system. The weapons system acquisition strategy that has been in effect in the United States since the 1950's has been to develop and deploy systems at the frontier of technology. This acquisition strategy uses high-risk technology and frequently results in a lengthening of the acquisition time and an increase in total cost. P^3I is designed to shorten the time required to field new weapon systems by using relatively mature technology initially and planning for incorporation of advanced technologies after the system is deployed.

2. DOD Acquisition Improvement Program

One of the initiatives set forth in Deputy Secretary of Defense Frank C. Carlucci's memorandum of April 30, 1981, to improve the acquisition program addressed the evolutionary acquisition concept of pre-planned product improvement. The concept will require extensive early planning, as early as the conceptual phase, with respect to technology development, design requirements for future growth of the system, manufacturing, and integrated logistic support considerations. The planning will also require the identification of funding requirements to support developing the technologies and system upgrades. The objectives of P^3I are;

a. Shorten the acquisition and deployment time for a new system or incremental capability.

b. Reduce overall acquisition, operating, and support costs.

c. Extend useful life of equipment.

d. Combat military obsolescence.

e. Reduce technical, cost, and schedule risk.

f. Accomplish orderly growth from initial to mature system reliability.

g. Reduce logistics and support problems entailed with new material introduction.

3. Implementation Status

Ideally, the concept of P^3I should be applied to a new system at program initiation, when it can be a design mechanism. To accomplish this the architecture of the basic system must be sufficiently flexible to accommodate modular changes. P^3I should be considered for ongoing systems only when the systems have a high degree of modularity and growth potential. Programs which have already utilized the concept of P^3I include:

a. The missile tubes for the Trident submarine. The tubes were constructed 83 inches in diameter, although the Trident I missile was only 70 inches in diameter. This spacing requirement was used to allow for the Trident II missile without major retrofit to the submarine.

b. The space, weight, and power requirements for later incorporation of a pressurization unit on the new Army/Marine Corps Light Armored Vehicle. The unit will allow the vehicle to operate more effectively in a nuclear, biological, or chemical environment.

4. P^3I Advantages

a. Reduce technological risk.

b. Allow for earlier deployment of supportable systems.

c. Increase the opportunity for subsystem competition if interfaces between primary and critical subsystems are managed well.

d. Improve field performance/reliability, since changes could be thoroughly tested first.

e. Reduce the logistics support burdens caused by dependence on "cutting-edge" technology.

f. Allow an increase in the effective operational life of a weapon system through long-term scheduled, programmed and budgeted upgrades.

5. Potential P^3I Disadvantages

a. Increased non-recurring costs owing to the continued engineering development of system upgrades after production of the basic system.

b. Allowance for space, weight, power, cooling and other provisions will increase the complexity of configuration control.

c. Increased funding visibility following plan identification in the PPBS cycle and the FYDP gives decision-makers the opportunity to trim the program and use the funds for other purposes.

6. Bibliography for Further Study

DOD Directive 5000.1, "Major Systems Acquisition," March 29, 1982.

DOD Directive 5000.2, "Major Systems Acquisition Procedures," March 19, 1980.

Morrow, G. E. "A Cultural Change: Pre-Planned Product Improvement." Concepts. Vol. 5, No. 3, 1982, pp. 16-25.

C. LEARNING (IMPROVEMENT) CURVE

1. Discussion

The learning curve (also called the improvement curve, cost or time reduction curve, or experience curve) was adopted from the known fact that individuals performing repetitive tasks exhibit a rate of improvement due to increased familiarity with such tasks. A Government commissioned study by the Stanford Research Institute [Ref. 1] confirmed the fact that cumulative direct labor cost per unit declines by a constant rate or percentage over successively doubled quantities of units produced. In other words, the number of direct labor hours necessary to produce the second or doubled quantity has been shown, on the average, to be only 70% to 90% of the hours required for the previous unit.

Material costs can also reflect improvement through repetitive purchases. The material curve, on the average, will exhibit a material cost of 90% to 99% of the material cost on the previous unit, depending upon the product being purchased.

In acquisition, the learning curve is probably most useful in across-the-table negotiations as a starting point for pricing a new item. In addition to providing "buyer's insurance" against overcharging, the learning curve is also used effectively by both government and commercial buyers in developing (1) target costs for new products, (2) make-or-buy information, (3) delivery schedules, and (4) progress payments to vendors [Ref. 2].

2. Historical Evolution

The man primarily responsible for establishing the learning curve as a cost measurement device in the aircraft industry is T. P. Wright. His article [Ref. 3] pioneering the idea (later known as the cumulative average or Northrop theory) was published in the Journal of Aeronautical Sciences in February, 1936, under the title "Factors Affecting the Cost of Airplanes". Wright's findings indicated that, as the number of aircraft produced in sequence increased, the average direct labor input per aircraft decreased in a regular and predictable pattern. Both aircraft companies and the Government became interested in the regular and predictable nature of production cost reduction because, among other considerations, the phenomenon implied that, during a time of mobilization, a fixed application of labor and facilities could be expected to produce greater and greater quantities of defense products in each successive time period.

During the early days of World War II, President Roosevelt surprised the nation with the statement that the United States would produce 50,000 airplanes. Many people criticized the President's statement because production in the aircraft industry at that time was insignificant in comparison with this figure. The President, with the assistance of his planners, knew how to get the plant and the equipment in operation, and he knew what the nation's production rate could be. The principal technique used for making this determination was the learning curve. For example, by applying the industry average curve, planners can get the manpower requirements for a given number of airplanes. Once they establish the manpower requirements and the units to be produced, they can project the plant capacity that will be needed, the amount of material that

must be ordered, the payroll and overhead costs, and many other production expenses. [Ref. 1].

The Wright curve worked very well as long as there was mass production of items with little or no change in configuration. After World War II, the trend changed to smaller quantities, drastic configuration changes, breaks in production, and other changes that caused the Wright curve projections on a cumulative average slope to produce questionable answers. Industry during the 1950's was becoming discouraged with the learning curve concept because it did not fit the new circumstances that the industrial world was facing. In the latter part of the decade, a unit improvement curve was developed by Boeing and restored confidence in the curves. In the Wright curve, the cumulative average cost (or hours) per unit produced declines by a fixed percentage as total quantities produced successively double. For example, with an 80% learning curve, if the first four units produced have a cumulative average cost of $500 per unit, the first eight units will have a cumulative average cost of $400 per unit. In the Boeing unit curve, it is the cost of the last unit produced after the total quantity produced has doubled that declines by a fixed percentage. For example, with an 80% learning curve, if the specific unit cost of the fourth unit was $500, the unit cost of the eighth unit will be $400.

The Boeing curve projects the unit curve as a straight line, whereas the Wright curve projects the cumulative average curve as a straight line (A learning "curve" becomes a straight line when it is plotted on log-log paper. There is no anomaly in calling it a curve when it is a straight line; in mathematical terminology a straight line is a particular case of a curve, having a curvature of zero). For the same learning curve percentage the slope will be flatter using the Boeing theory resulting in a

greater cumulative total hour requirement for subsequent doublings than would occur under the Wright theory.

3. Considerations in Use

The primary purpose for developing the learning curve as a pricing tool is to permit one to predict the cost of future production. The prediction is based upon the assumption (not always true) that the future will be like the past. In terms of the learning curve theory, this assumption means that the cost (hours) of doubled quantities will continue to decrease by some constant percentage. The learning curve method provides a reasonable approach to predicting the future if the historical data approximate a straight-line trend. The farther historical data points lie from the trend line, the less confidence should be placed in the prediction. To factor out some extraneous items it is best to use manhours rather than dollars. The latter contain additional variables, the effects of inflation or deflation (wage rate changes), which are absent in the former. The line of best fit can then be constructed by what is known as least squares regression analysis.

With actual learning curve data, practically all slopes will lie between 50% and 100%. Slopes steeper than 50% are almost never observed and slopes greater than 100% represent disimprovement. For learning curves, the steeper the slope, the greater the rate of learning and the smaller the percentage figure by which the slope is represented. Thus, a 70% slope is steeper than a 75% slope.

Many experts now agree that many factors other than workers' learning affect the rate of improvement. These include new types of tooling, improved scrap rates, less spoilage, more effective plant layout, better methods and procedures of operating, improved management and administration, and new mechanization and automation.

4. Potential Applications

A Defense Contract Audit Agency publication (DCAAP 7641.14) provides information on more than 440 learning curve applications, covering a broad spectrum of weapon systems, subsystems and other items. Additionally, in 1964, Winfred Hirchmann stated in the Harvard Business Review that, "No matter what products you manufacture or what type of operation you manage, there is a good possibility you can profit from the learning curve" [Ref. 4].

The learning curve can be used effectively by both government and commercial firms in developing target costs for new products. It is an invaluable aid in establishing an initial supplier-buyer basis for arriving at a fair schedule of prices for future orders.

A comparison of separate learning curves for both a buyer's firm and his supplier's firm can help the buyer decide whether to make or buy a specific part, particularly when his own plant is operating well below capacity. Projections on the learning curves will tell the buyer whether he or the supplier will have lower average costs for the number of units needed.

Since the learning curve can be used to forecast labor time required, it is possible to estimate how many units a vendor can produce over a specified time with a given labor force. This information can be extremely helpful to the buyer in scheduling deliveries, in planning his own firm's production, and in identifying suppliers who obviously cannot meet desired delivery schedules.

Since the learning curve reflects changing labor costs, it provides a basis for figuring a supplier's financial commitment on any given number of units. This information is important, because suppliers often operate in the red during the initial part of a production run, until

learning can reduce average cost below the average price. Buyers can minimize supplier hardship by using the learning curve to break down an order into two or more production lots---each with successively lower average prices---and then set up progress payments based on the supplier's costs.

5. Pitfalls to Avoid

In using learning curves, buyers must be alert to the following problems [Ref. 2].

a. Nonuniform learning rates. If a straight line cannot be fitted to the historical data reasonably well, the technique should not be used.

b. Low-labor-content items. If most work on a new item involves machine time, where output tends to be determined by machine capacity, there is little opportunity for continued learning.

c. Small payoffs. Gathering and plotting data entail much time and effort. Thus, the learning curve should be used only where there is an expectation of a reasonable payoff.

d. Incorrect learning rates. Data are unique to the firm involved and should not be applied to another firm.

e. Established items. As most of the learning was already done on previous work, any additional cost reduction may well be negligible.

f. Production breaks. No consistently reliable method exists for predicting the amount of learning that will be lost as a result of production breaks. However, if any impact impact from a production break exists, the

greatest impact would be on direct labor learning (i. e., learning retrogression) and the least impact would be on methods improvements developed during the initial production run. A return to unit one as the starting point for a follow-on order or contract is unreasonable.

6. References

1. Air Force Institute of Technology. *Contract Administration*. Vol. 2, Chapter 26, 1980.

2. Lee, Lamar, Jr. and Dobler, Donald W. *Purchasing and Materials Management: Text and Cases*. McGraw-Hill Book Company, 1977.

3. Wright, T. P. "Factors Affecting the Cost of Airplanes." *Journal of Aeronautical Sciences*. February, 1936.

4. Hirchmann, Winfred B. "Profit from the Learning Curve", *Harvard Business Review*. January-February 1964, pp. 125.

7. Bibliography for Further Study

Government Contracts Reporter. *Armed Services Procurement Regulation Manual for Contract Pricing*. Illinois: Commerce Clearing House, Inc., 1975.

VI. LOGISTICS MANAGEMENT

A. MARKET RESEARCH AND ANALYSIS

1. Discussion

Beyond recognition of an immediate need, requesting activities seldom grasp the economic or technical ramifications of a given acquisition. The contracting officer, therefore, is tasked with conducting an applicable search of the market to develop data that may help the activity determine current and future needs and point up possible areas where changes need to be made or where more detailed advanced planning is necessary. This market research can also help the contracting officer determine the type of contract to use and how best to serve the customer agency needs.

2. The Purpose of Market Research in the Acquisition Process

No request for procurement action should be taken at face value. It is the duty of the contracting officer to help and advise the requestor in the fulfillment of its needs. One of the many tools the contracting officer uses is market research. Some of the questions the contracting officer will seek to answer when conducting the research will be:

a. Is the requirement realistic in light of current industry capabilities?

b. Can the requirement be fulfilled by means/methods/materials other than those actually called for?

c. What simple/complex manufacturing processes are involved and what are the associated lead times?

d. How much should the item cost?

e. Who are the suppliers best equipped to do the work?

f. Are standard products/materials available to do the work?

In response to a request for procurement action, a carefully conducted market research effort will show whether or not the given industry can meet the needs of the requestor. If industry cannot meet the requestors' needs, perhaps because of delivery lead time problems based on the scope of the work to be done or technical limitations in design or performance requirements or a myriad of other reasons, the contracting officer will have the ability and the information at hand to approach the requesting activity and suggest possible options for the modification or revision of the specifications to conform to the industry's capabilities. Further, the research will yield various strengths and weaknesses of the applicable industry (or firm). These data may be used to tailor the requirement to take full advantage of cost and performance benefits derived from a concentration on industry strengths while avoiding putting too much emphasis on areas where industry is weak and, hence, cost inefficient. Much of the time past experience with the market (that is, having completed relevant market research in the past) will show the contracting officer that the immediate requirement can be satisfied by a

method or item not known to the requesting activity. Even when the methods and materials are known, the contracting officer may be in a position to propose alternative methods or materials based on his intimate knowledge of the market, its price trends and technological developments.

A review of manufacturing processes called for, the level of skill required and the amount of available capacity needed will allow the contracting officer to determine the number of suppliers available, those willing and able to compete, the level of risk they are willing to or should be asked to assume, the need for discussions based on the level of competence in the industry and the complexity of the work involved, and industrys' overall ability to fill the need. These considerations will allow the contracting officer to determine which type of contract is best suited to be used for the particular procurement.

3. Market Research Preplanning

Preplanning is the key to effective market research. Naturally there are many procurements that do not require an in-depth market research action. Most, however, involve much more than the delivery of an end-product. Through early planning the requestor and the contracting officer can share each others expertise and knowledge. The market can be researched with an eye toward tailoring the procurement package along the most cost-effective, efficient and beneficial lines industry has to offer. By coupling preplanning with an effective market research effort, many of the pitfalls, such as inadequate specifications, compressed delivery schedules, improper contract type, unsatisfactory suppliers, and cost-inefficient terms and conditions, can be significantly reduced or totally eliminated.

4. Key Factors in the Use of Market Research

Market research has a number of advantages, but it also has a required precedent in order to be effective.

a. Shows industry's strengths and weaknesses

b. Reduces risk of inadequate specifications or contract type

c. Allows taking full advantage of industry capabilities

d. Reduces cost-inefficency through concentration on strengths

e. Provides for flexibility in the fulfillment of requirements

f. Provides historical base on which to build future requirements

g. Improves accuracy of lead time projections

h. Provides for accurate list of qualified sources

i. Requires solid preplanning to be effective

5. Bibliography for Further Study

Fox, J. Ronald. Arming America. Massachusetts: Harvard University Press, 1974.

Lee, Lamar, Jr., and Dobler, Donald W. Purchasing and Materials Management: Text and Cases. McGraw-Hill Book Company, 1977.

Sherman, Stanley N. Government Procurement Management. Maryland: Wordcrafters Publications, 1981.

B. PERT AND CPM

1. Discussion

PERT (Program Evaluation and Review Technique) is used for managing the time (duration) of projects and was developed in 1958 by the U. S. Navy for use on the Intercontinental Ballistic Missle Program [Ref. 1]. CPM (Critical Path Method) is used for managing both the time and cost of projects and was developed in 1955 by Du Pont and Remington Rand to manage complex plant maintenance problems [Ref. 2]. PERT and CPM are intended to identity schedule and cost slippages early in the project cycle so that corrective action can be taken in time to meet the final time and cost objectives.

PERT and CPM augment other management aids. Phasing charts, milestone charts, management control charts, line of balance (LOB) networks, Gantt charts and bar charts are used principally for presenting the status of an overall program. PERT and CPM point out potential trouble spots before they actually occur, but, more importantly, they are planning procedures in addition to being control tools. In PERT, three estimates are used to derive a weighted average of the expected completion time from a probability distribution of completion times. Therefore, PERT is considered a probabilistic tool. In CPM, there is only one estimate of duration; that is, CPM is a deterministic tool. The second difference is that CPM allows an explicit estimate of costs in addition to time. Thus, while PERT is basically a tool for planning and control of time, CPM can be used to control both the time and the cost of the project. [Ref. 3].

The ideas behind PERT and CPM have wide application and can be used in situations as diverse as managing office paperwork flow and the construction of major buildings.

2. Objectives

PERT and CPM attempt to answer the following questions:

- a. Which activities are critical? That is, which must be completed on time to keep the project on schedule?
- b. Which activities are noncritical?
- c. How much flexibility does management have in executing the noncritical activities?
- d. What is the earliest expected completion date for the project?
- e. What is the best way to handle delays that are detected during execution of the project?

In addition, PERT can be used to answer questions such as:

- a. What is the chance of completing a project by a desired date?
- b. For how long should a project be planned so that a given probability of completion is attained?

Also, CPM can be used to answer such questions as:

- a. What is the least-cost way to expedite the completion of a project?
- b. What is the shortest possible time for a project to be completed?

3. Program Benefits

In addition to the fact that several government agencies require the submission of a PERT or CPM plan with a bid, there are several advantages associated with using these analytical methods.

a. The use of PERT and CPM forces management to plan in detail and to define what must be done to accomplish the project's objectives on time.

b. Management is forced to plan and make commitments regarding execution times and completion dates. The methods also provide for better communication among the various departments in an organization and between suppliers and the government agency.

c. The number of critical activities in a network is only a small portion of the total activities. Identification of the critical activities enables the use of an efficient monitoring system (mainly record keeping and reports) concentrating only on the critical activities.

d. The critical activities are also more likely to become problem areas. Once identified, contingency plans may be devised.

e. Employing PERT or CPM enables management to use resources more wisely by examination of the overall plan. Resources can be transferred to bottleneck or trouble areas from other activities.

f. The PERT and CPM methods enable management to follow up and correct deviations from schedule as soon as they are detected and, thus, minimize delays.

g. PERT and CPM can be easily understood because they provide a method for visualizing an entire project. Therefore, management can explain the tools to supervisors and employees in such a way that the chances of implementation are improved.

h. PERT and CPM are easily adaptable to computer use. Large projects can be planned by computers in seconds, and computers are now even capable of diagramming the networks.

i. PERT and CPM allow management to check the effectiveness and efficiency of alternative ways of executing projects.

4. Stages of Analysis

The use of PERT or CPM involves three major stages: formulation, planning, and monitoring and control. Each stage includes a number of steps which are presented below.

Formulation

a. Analyze the project and break it down into specific activities and events.

b. Determine the sequence of activities and events.

c. Construct a diagram (network) of the project.

d. Estimate time durations (also cost, in CPM) of all activities.

Planning

a. Compute the earliest and the latest dates.

b. Find the slack in events; identify critical events.

c. Find the slack in activities and identify critical activities.

d. Find the critical path.

Monitoring and Control

a. Monitor critical activities; compare progress to plan.

b. Identify deviations from the plan.

c. Replan if necessary.

d. Transfer resources to lagging activities.

Identification of critical events and activities enables management to exercise better control of the project by using a management-by-exception philosophy. In addition to transferring resources to critical activities, management may correct delays by other actions such as the following:

a. Relaxing the technical specifications or the required quality.

b. Changing the scope of the project by reducing the desired goals and, consequently, the amount of work.

c. Changing the sequencing of activities.

d. Pouring additional resources into the project.

e. Expediting activities by various incentives.

f. Starting activities while preceding ones are still being completed.

5. References

1. Air Force Institute of Technology. Contract Administration. Vol. 1, Chapter 13, 1980.

2. Lee, Lamar, Jr. and Dobler, Donald W. Purchasing and Materials Management: Text and Cases. McGraw-Hill Book Company, 1977.

3. Turban, Efraim and Meredith, Jack R. Fundamentals of Management Science. Texas: Business Publications, Inc., 1981.

APPENDIX A
COST ACCOUNTING STANDARDS

A. DISCUSSION

The Cost Accounting Standards Board was established in 1970 under authority of amendments to the Defense Production Act and remained in operation until funding was terminated in October of 1980. The Comptroller General of the United States served as Chairman of the Board and appointed four additional members. Members appointed to the Board included two from the accounting profession (one of whom was particularly knowledgeable about the cost accounting problems of small business), one representing industry, and one from a department or agency of the Federal Government appointed with the consent of the head of the department or agency concerned. Nineteen standards were approved and promulgated by the Board.

B. REQUIREMENT TO COMPLY

The standards are applicable to contractors within the following criteria:

1. The contract is a negotiated contract; competitively awarded contracts are not covered.
2. Contracts less than $500,000, contracts for products with an established market price and

contracts for products that have prices fixed by law are not covered.

3. Negotiated contracts awarded to a small business firm or a firm in a labor surplus area are not covered.

4. A waiver may be granted to a sole source contractor who refuses to submit a Disclosure Statement (Form CASB-DS-1).

5. If a contractor's total negotiated government contract business is less than $10 million annually or less than 10% of total corporate sales, the contractor is eligible for modified coverage where only CAS 401 and 402 must be complied with.

C. SYNOPSIS OF EFFECTIVE COST ACCOUNTING STANDARDS

401--Consistency in Estimating, Accumulating, and Reporting Costs

Purpose: To insure that each contractor's practices used in estimating costs for a proposal are consistent with cost accounting practices used by him in accumulating and reporting actual costs.

Effective Date: 1 July 1972

402--Consistency in Allocating Costs Incurred for the same Purpose

Purpose: To require that each type of cost is allocated only once and on only one basis to any contract or other cost objective.

Effective Date: 1 July 1972

403--Allocation of Home Office Expenses to Segments

Purpose: To establish criteria for allocation of the expenses of a home office to the segments of the organization on the basis of the beneficial or causal relationship between the expenses and the receiving segments.

Effective Date: 1 July 1973, Contractor's FY after 30 September 1973

404--Capitalization of Tangible Assets

Purpose: Requires that, for purposes of cost measurement, contractors establish and adhere to policies with respect to capitalization of tangible assets which satisfy criteria set forth herein.

Effective Date: 1 July 1973, Contractor's FY on or after 1 October 1973

405--Accounting for Unallowable Costs

Purpose: To facilitate the negotiation, audit, administration, and settlement of contracts by establishing guidelines covering

(1) identification of costs specifically described as unallowable at the time such costs first became defined or authoritatively designated as unallowable and

(2) the cost accounting treatment to be accorded such identified unallowable costs.

Effective Date: 1 April 1974

406--Cost Accounting Period

Purpose: To provide criteria for the selection of the time periods to be used as cost accounting periods for contract cost estimating, accumulating, and reporting.

Effective Date: 1 July 1974, Contractor's next FY beginning after receipt of a contract to which this CAS is applicable.

407--Use of Standard Costs for Direct Material and Direct Labor

Purpose: To provide criteria under which standard costs may be used for estimating, accumulating, and reporting costs of direct material and direct labor; and to provide criteria relating to the establishment of standards, accumulation of standard costs, and accumulation and disposition of variances from standard costs.

Effective Date: 1 October 1974, Contractor's next FY after receipt of a contract to which this CAS is applicable.

408--Accounting for Costs of Compensated Personnel Absence

Purpose: To improve and provide uniformity in the measurement of costs of vacation, sick leave, holiday, and other compensated personal absence for cost accounting period.

Effective Date: 1 July 1975, Contractor's next FY beginning after the receipt of a contract to which this CAS is applicable.

409--Depreciation of Tangible Assets

Purpose: To provide criteria and guidance for assigning costs of tangible capital assets to cost accounting periods and for allocating such costs to cost objectives within such periods.

Effective Date: 1 July 1975, Contractor's next FY after the receipt of a contract to which this CAS is applicable.

410--Allocation of Business Unit G & A Expense to Cost Objectives

Purpose: To provide criteria for the allocation of a group of business unit expenses commonly identified as G & A expense based on their beneficial or causal relationship to business unit final cost objectives.

Effective Date: 1 October 1976

411--Accounting for Acquisition Cost of Material

Purpose: To provide criteria for the accounting for acquisition costs of material, including provisions on the use of inventory costing methods.

Effective Date: 1 January 1976

412--Composition and Measurement of Pension Costs

Purpose: To provide for determining and measuring the components of pension cost.

Effective Date: 1 January 1976

413--Adjustment and Allocation of Pension Cost

Purpose: To provide quidance for adjusting pension cost by assigning actuarial gains and losses to cost accounting periods. The standard also provides the bases on which pension cost shall be allocated to segments of an organization.

Effective Date:10 March 1978

414--Cost of Money as an Element of the Cost of Facilities Capital

Purpose: To establish criteria for the measurement and allocation of the cost of capital committed to facilities as an element of contract cost.

Effective Date: 1 October 1976

415--Accounting for the Cost of Deferred Compensation

Purpose: To provide criteria for the measurement of the cost of deferred compensation and the assignment of such cost to cost accounting periods.

Effective Date: 10 July 1977

416--Accounting for Insurance Costs

Purpose: To provide criteria for the measurement of insurance costs, the assignment of such costs to cost accounting periods, and their allocation to cost objectives.

Effective Date: 10 July 1976

417--Cost of Money as an Element of the Cost of Capital Assets Under Construction

Purpose: To establish criteria for the measurement of the cost of money attributable to capital assets under construction, fabrication or development as an element of the cost of those assets.

Effective Date: 15 December 1980

418--Allocation of Direct and Indirect Costs

Purpose: To (a) provide for consistent determination of direct and indirect costs, (b) provide criteria for the accumulation of indirect costs, including service center and overhead costs, in indirect cost pools, and (c) provide guidance relating to the selection of allocation bases based on the beneficial or causal relationship between an indirect cost pool and cost objectives.

Effective Date: 20 September 1980

420--Accounting for Independent Research and Development Costs and Bid and Proposal Costs

Purpose: To provide criteria for the accumulation of independent research and development costs and bid and proposal costs and for the allocation of such costs to cost objectives based on the beneficial or causal relationship between such costs and cost objectives.

Effective Date: 15 March 1980

D. BIBLIOGRAPHY FOR FURTHER STUDY

Cost Accounting Standards Guide. Commerce Clearing House, Inc., 1978.

Wright, Howard W. and Bedingfield, James P. *Government Contract Accounting*. Washington, D. C.: Federal Publications, Inc., 1979.

APPENDIX B

CERTIFIED PROFESSIONAL CONTRACTS MANAGER (CPCM)

Test Questions

A. DISCUSSION

To date (Mar 1983) there have been fourteen CPCM examinations conducted by the National Contract Management Association (NCMA). The examination divides as follows for the questions included below:

1. General Exam (morning)

Required questions---two out of three must be answered.

General questions---any three out of five or six must be answered.

2. Area of Specialization (afternoon)

There are five categories to select from:

Legal

Finance, Economics and Accounting

Production

Contracting

Logistics Management

Each category normally has from 4-8 questions. Five questions must be answered within these constraints:

Any three questions from one category.

One selection each from any two other categories.

3. Key to Question Numbering

Category---GEN (General), LEG (Legal), FEA (Finance, Economics and Accounting), PRO (Production), CON (Contracting) and LM (Logistics Management).

Exam No.---The number I through XIV is the exam where the question last appeared (Exam XIV was given in November 1982).

Frequency---The number in parentheses is the number of times the question has appeared on previous exams (in the form given or in an equivalent form).

B. GENERAL QUESTIONS

GEN-XIV-(1)----The objective of a good procurement organization is to obtain what the agency needs to carry out its mission, on time, and at a reasonable price. Discuss the role of market analysis and research in achieving this objective both from the standpoint of product or service quality and price.

GEN-XIV-(5)----Discuss ethical behavior in procurement. Include the potential for abuse by suppliers, requirements personnel, design engineers, buyers, contract negotiators and administrators, inspectors, and those who receive, store, stock, and issue materials to users. What guides, law or standards for ethical behavior are available for purchasing in the private and public sector?

GEN-XIV-(3)----Industry and government are to a great extent organized along functional lines. In order to concentrate management attention on specific products or tasks to assure successful completion of a complex project which may fail in a routine treatment, organizations have infused the project management concept. Briefly describe the project management concept in a traditional functional organization, how it interfaces with the functional elements, its potential, and the possible problems it can create for the contract manager.

GEN-XIV-(1)----Describe organizational conflict of interest and the competing interests involved in the Government's effort to obtain maximum benefit from competition.

GEN-XIV-(1)----Discuss the essentials and benefits of advance procurement planning--both from the standpoint of the total procurement program of a procuring activity and from the standpoint of individual procurements.

GEN-XIV-(6)----Discuss what can be done to enhance the role, professional status, career interest, and rewards of the purchasing officer in industry or the contracting officer in Government in terms of training, education and developmental experiences.

GEN-XIV-(11)---In addition to requiring contractors to meet its procurement objectives, the Federal Government often includes in its contracts social and/or economic objectives. Such objectives may be only indirectly related to the procurement objective. Identify five such social and/or economic policies and discuss each in terms of effectiveness, propriety and cost.

GEN-XIII-(9)---Identify and briefly describe the various functions one would expect to find under the umbrella of materials management in the industrial environment.

GEN-XI--(4)----What are the objectives of the materials management concept?

GEN-XIII-(5)---Discuss the role of the contracting officer in Federal procurement, citing recent studies and recommendations concerning his role, competency and effectiveness. Explain his relationship to other management functions in government and his relationship to program managers.

GEN-XIII-(2)---You are responsible for establishing performance measurement criteria for evaluating a purchasing department. Select either a commercial firm or a Government organization and briefly describe three of the most important performance measurement criteria.

GEN-XII-(1)----There has been an impression conveyed to the public that there is a polarization between business and government, and that public policy adversely affects

business. It would appear there is a solid cohesive business block with common interests defending itself against a government which is inimical to its interest. Present facts or recent events which would support or oppose the above impression and your views as to whether there is a need for government concern in the behavior or conduct of business.

GEN-XII-(10)---Our industrial productivity in recent years has not measured up to the progress experienced by other developed nations, some of which we assisted after World War II. This has reduced our competitive status in international trade. What do you perceive to be the underlying causes for our reduced productivity?

GEN-XI--(3)----Recently a congressional review of our defense industrial base revealed an unhealthy situation of declining productivity growth, aging facilities and machinery, shortages in criterial materials, prolonged lead times, and skilled labor shortages. What do you perceive the government can do to correct this condition and improve industrial responsiveness?

GEN-XII-(6)----Identify and briefly discuss the primary differences between commercial contracts and Government contracts.

GEN-XII-(0)----It appears that in the U. S. inflation will persist for the forseeable future. Doing business in an inflationary economy raises numerous problems. Discuss problem areas, with emphasis on problems in the purchasing area.

GEN-XI--(0)----The Small Business Administration has defined social disadvantage with respect to its Section 8(a) program. What elements must one demonstrate to establish a convincing case of social disadvantage?

GEN-XI--(1)----An Agreement on Government Procurement was signed in the spring of 1979 as a part of the multi-lateral trade negotiation and was approved by Congress under Public Law 96-39. It forsees a basis for mutual reduction of international trade barriers in government procurement. Executive Order 12260 was issued to implement the agreement which in effect prohibits discrimination against foreign suppliers of countries party to the agreement in the government procurement process. The Department of Defense issued a new Part 16 to the Defense Acquisition Regulation to put the executive order into effect. Discuss the impact of these actions on the Buy American Act, Small Business Programs, war materials, construction, R & D, services, Labor Surplus Area set asides, and balance of payments.

GEN-XI--(0)----There is often a sentiment expressed that government should be run like a business with sound business management practices. Discuss the problems government would encounter in such management practices with respect to its objective, organization, coordinating and controlling.

C. LEGAL QUESTIONS

LEG-XIV-(5)----What is the purpose of the requirement in the Contract Disputes Act that the contractor certify his claim? What is the role of certification in terms of (a) actions to be taken by the contracting officer, (b) the contractor's right, if any, to collect interest, and (c) the contractor's right to appeal to the Board of Contract Appeals or the United States Court of Claims.

LEG-XIV-(0)----As of October 1, 1982, two new courts formed, entitled the United States Court of Appeals for the Federal Circuit and the United States Claims Court. Describe the make up and function of these courts in relation to (a) the United States Court of Claims as it existed before October 1, 1982, and (b) the contractor or bidder's rights to sue for injunctive relief against the Government.

LEG-XIV-(5)----What are the Government's rights and remedies in the Inspection Clause which appears in the General Provisions (SF32) of a Government contract?

LEG-XIV-(7)----A contractor had submitted 5 vouchers amounting to $50,000 in total for materials and services rendered under a fixed rate contract plus materials at cost. The Government paid one of the vouchers in the amount of $10,000 and upon receipt of information of irregularities from an inspector the contracting officer requested an audit and withheld payment on the other 4 vouchers. The auditor found that the contractor's books of accounts were not properly maintained and with great difficulty reconstructed the costs for materials and services to be $35,000 instead of $50,000. Thereupon the contracting officer terminated the contract and refused to pay any amount on the basis that the claims are forfeited due to fraudulent billings. The

auditor's report indicated clearly that the billings were the result of gross negligence and ineptness in maintaining proper records. The contractor sued for breach of contract and the Government counterclaimed fraud and sought penalties for violations of the False Claims Act. Discuss the relative merits of the parties' claims and counterclaims and your adjudication of the matter.

LEG-XIII-(8)---Cite and discuss the significant differences regarding the law of agency as it applies to officials of the Federal Government and representatives of private firms.

LEG-XIII-(0)---In a firm fixed price contract calling for supplies to be delivered in accordance with a specified schedule, the contractor is late. As the contracting officer, what are your considerations in determining a proper course of action for the government?

LEG-XIII-(7)---Identify the contractual adjustments which may arise under P. L. 85-804 (extraordinary relief). Why do we have this authority?

LEG-XIII-(1)---A bidder hand carried his bid to an agency and did not comply with instructions in the IFB to address the bid to the designated room for bid opening and identify on the envelope that it contains a bid with the IFB number. The bidder asked the guard for the location of the bidders room. The guard directed the bidder to the materials receiving office where the bidder left his bid with the receptionist. The receptionist took the bid and gave the bidder a receipt for hand carried documents. The bid was delivered after bid opening to the designated buyer. Discuss the responsibilities of the bidder in the delivery of a bid and whether this is a late bid or mishandling by the government.

LEG-XIII-(12)--State concisely the principal rights and obligations of parties as established by the Changes Clause.

LEG-XII-(4)----List and explain the significant matters to which the decision maker should direct his attention when he is considering taking default action.

LEG-XII-(5)----What changes were brought about by the Contract Disputes Act of 1978? Contrast these procedures with commercial arbitration.

LEG-XI--(0)----A fixed price contract was terminated for default on the basis that performance clearly indicated an inability to meet a contractual delivery schedule. The agency resolicited the requirement. Before the closing date for receipt of proposals the agency determined that the cause for the default had been corrected and delivery expected under a new procurement would be later than the delivery expected from the defaulted contractor. Discuss whether the agency can cancel the solicitation of the reprocurement and reinstate the defaulted contract.

LEG-XI--(2)----Prior to receipt of a final payment of an invoice under a fixed price contract the contractor sent a letter asserting a claim for a constructive change. The claim was not processed but the final payment was subsequently processed, and the contractor accepted the check. Then the contractor submitted another claim based on a constructive change. What are the rights of the contractor in pursuing both claims?

LEG-XI--(7)----A contractor when submitting a proposal failed to present true data under the "Truth in Negotiations" Act (P. L. 87-653) and the contract was negotiated on the basis of incorrect data. At a later audit it was determined there was an overpricing of 30%, and the

contractor by that time submitted 5 invoices for payment of partial deliveries. The last invoice for the final delivery was not paid to offset in part the overpricing. This matter was ultimately referred to the U. S. Attorney after the contractor refused to reimburse the government. The U. S. Attorney brought suit under the False Claims Act. Discuss the merits of the action by the U. S. Attorney and the possible penalties the contractor may suffer from such action.

LEG-XI--(1)----Discuss the rights of unsuccessful low offerors to gain access to proposal evaluations and details of awardee's proposals under the Freedom of Information Act.

LEG-XI--(0)----A contractor presented a claim for a change. There was a protracted negotiation on the change. After a settlement had been negotiated the government delayed in processing a modification and by the time the contractor could submit an invoice for payment seven months had passed since settlement and another month was consumed to effect the payment. The contractor claims interest from the date of the change. Discuss the extent, if any, of the contractor's entitlement to interest.

D. FINANCE, ECONOMICS AND ACCOUNTING QUESTIONS

FEA-XIV-(7)----Prices structured by industry include a profit factor. Discuss the underlying considerations in determining a fair and reasonable profit.

FEA-XIV-(5)----Overhead accounting deals with the measurement and allocation of costs not directly associated with the product. Describe various techniques for overhead cost control and indicate why these techniques tend to differ from techniques for control of direct material, direct labor and other direct costs.

FEA-XIV-(1)----X Company developed a new product which cost $3 million in R & D. It has a capacity to produce 12,000,000 units during the year. Its marketing department assures management that the item is hot, the public will jump at it, and it can be expected the entire production capacity will sell. The company has a fixed manufacturing overhead of $6,000,000 per year and $3,000,000 fixed general and administrative expenses. It is estimated semi-variable costs in manufacturing overhead will be 50% of direct labor costs and the semi-variable costs in G & A will be 10% of total manufacturing costs. It would like to recoup the R & D costs during the first year. It estimates the average cost of direct labor would be $1 per unit and $2 per unit for material. The company's objective is to make a profit of $7,200,000 on the product for the year. At what unit price must it sell each unit to attain the objective?

FEA-XIII-(1)---Define direct and indirect cost and explain why and how the two types of cost are treated differently in a contractor's accounting system.

FEA-XIII-(1)---Included in the indirect cost accounts is an item of rental payments. This contractor leased an entire facility for 20 years. The terms of the lease provided for 50% of the total rent to be paid during the first 5 years and the remaining 50% over the residual 15 years. In determining reasonable and allocable costs, considering cost accounting standard 404 and cost principles covering rental costs, to what extent would you allow rental payments?

FEA-XIII-(1)---Explain how the concept of a "fair and reasonable" price is validated for a formally advertised as opposed to a negotiated Government contract.

FEA-XIII-(4)---As a negotiator for a commercial firm, how would your negotiation strategy differ if your firm is economically part of (a) an oligopoly, (b) an effective monopoly, or (c) a large competitive market?

FEA-XIII-(6)---An analysis of the current financial position is required to determine the financial capability of a firm. Indicate how you would determine the ability of a firm to meet its financial obligations. Use both quantitative and qualitative analysis.

FEA-XII-(6)----Under what conditions can a firm charge different prices for the same product to the same type of customer?

FEA-XII-(2)----In cost analysis, one of the cost entries to be analyzed and evaluated is depreciation. The two methods in common use for figuring depreciation are the "straight-line method", and the "sum-of-the-year's digits method". How do the methods differ? Which yields the higher net present value? As the buyer, would it make any difference to you which method the vendor used?

FEA-XII-(0)----The Congress of the United States appropriates monies for procurement purposes annually. The monies are designated as "one-year", "multi-year" and "no-year". Discuss the significance of this in Federal procurement programming, contracting, and contract administration.

FEA-XII-(3)----Differentiate between price analysis and cost analysis as used in evaluation of proposals in government procurement. What general considerations govern the selection of the appropriate analytical approach?

FEA-XI--(1)----Procurement is one of the ways the government's fiscal policy affects the economy. Discuss how effective is procurement as compared to other methods of government spending.

FEA-XI--(0)----Some organizations establish objectives and budget for a period projecting requirements and the cost of materials used in producing a product. They then compare actual costs with the budgeted costs. Performance is measured by means of variance accounts. What does a variance account show and what shortcomings can you perceive in using a materials budget for performance measurement?

E. CONTRACTING QUESTIONS

CON-XIV-(7)----What defines a "competitive range"? What factors should be considered in excluding an offeror from the "competitive range"?

CON-XIV-(3)----Distinguish the "functional" specification from the "performance" specification. Discuss the feasibility of using both types of specifications in one contract.

CON-XIV-(7)----Explain the Cost-Plus-Award-Fee contract. Specify its essential provisions and explain how it differs from the Cost-Plus-Incentive-Fee contract and the principal advantages and disadvantages for the manager.

CON-XIV-(0)----Under what conditions would Government Property form a basis for altering the price agreement during performance of a Government contract?

CON-XIII-(4)---As a negotiator for either the Government or a commercial firm, you are preparing to negotiate with your counterpart. What elements are important to you in determining what motivates your "opponent"?

CON-XIII-(7)---Compare the Firm-Fixed-Price and Cost-Plus-Fixed-Fee contracts. Explain specific major differences and similarities and why you think they are important.

CON-XIII-(7)---Describe a contractor's responsibility for government owned property and the conditions under which there is relief of liability for such property.

CON-XIII-(1)---Identify several important aspects the Government contracting office should consider in reviewing a contractor's proposed subcontract for the purpose of granting consent.

CON-XII-(0)----Discuss the decision to create a second source. What are the principal considerations? If the object being procured is technically complex, second source creation can be difficult. Why?

CON-XII-(0)----The Federal Government views inspection, acceptance and warranties of products and services differently than the private sector--and the clauses in a Government contract reflect these differences. Identify the major differences and discuss the rationale for them.

CON-XII-(2)----List the key decisions procurement managers make during their planning and preparation efforts for new contractual undertakings.

CON-XII-(0)----One of the functions carried out as part of procurement and contract management is review and approval of contract actions. Identify three types of actions subject to review. Discuss the objectives of the review and the questions pertinent to each type of action you identified.

CON-XII-(2)----As a Government negotiator, how would your negotiation strategy differ when dealing with a contractor in the following situations?

a. sole source contractor

b. competitive environment

c. oligopolistic firm

d. regulated industry

CON-XI--(0)----Some contractors possess facilities under facilities contracts for use on specific government contracts. Discuss the ramifications on the intended use of those facilities for awards under consideration under an IFB

and negotiation resulting from a RFP issued by an unrelated agency.

CON-XI--(0)----You are a contracting officer who awarded a trucking contract and a short time later you observe an item in the newspaper that the contractor was convicted of a corruption of a government employee in attempting to influence, obstruct and impede the due administration of justice. Do you consider that it is incumbent for you to take the necessary action to terminate your contract? Give the basis for your decision.

CON-XI--(7)----In a competitive negotiated procurement on a fixed price basis there was a protest on the award of a contract to the successful offeror on the basis that a protion of the proposal was non responsive. Discuss the propriety of such protest and the basis for your disposition of the protest considering it was made within the proper time limitations.

CON-XI--(1)----Recently new regulations were issued as part of the Federal Procurement Regulations pertaining to the acquisition of automatic data processing equipment, commercially available software, maintenance services and supplies by government agencies and contractors. To what extent is an agency contracting officer free to acquire these items? Discuss the policies, procedures and selection criteria a contracting officer is required to follow in fulfilling a procurement request for those items.

CON-XI--(1)----What are the detrimental effects, in the procurement or acquisition process, of a specification or work statement which lacks clarity or sufficient definitive requirements?

F. PRODUCTION QUESTIONS

PRO-XIV-(0)----A number of Japanese firms have gone to an inventory system termed "just in time", (incoming materials arrive at the plant-just in time to be installed and used in the production line). What changes would be required in the firm's procurement and production systems to implement this concept?

PRO-XIV-(8)----What are the primary elements of a firm's quality assurance program? Discuss the purpose and relationship of these elements to other activities in the firm.

PRO-XIV-(3)----What is the fundamental objective of value analysis in controlling materials? Describe the phases included in an overall value analysis study.

PRO-XIV-(3)----Define five analytical, commonly used methods of production planning, scheduling and control. Briefly discuss their basic characteristics and advantages/ disadvantages.

PRO-XIII-(8)---Factory automation, computer aided design/ computer aided manufacturing (CAD/CAM) and robotics are revolutionizing the production process. Discuss these changes in technology and their impact on the procurement/ contracting process.

PRO-XIII-(8)---Various methods have been developed to graphically portray scheduling in production planning. Among those methods are:

milestone charting

bar graph charting

Gantt charting

line of balance charting

PERT and CPM

a) Briefly discuss the basic characteristics and the use of each of the above methods.

b) What advantage does PERT or CPM offer over the other methods?

PRO-XIII-(11)--Discuss the factors which are considered in a Make or Buy decision by an industrial organization and a Government agency. Consider the similarities and differences.

PRO-XIII-(0)---Compare quality assurance and inspection/ acceptance testing.

PRO-XII-(5)----Discuss the use of inventories in a manufacturing environment. Address your answer to the types and functional purposes of inventories.

PRO-XII-(2)----Discuss the significance of "lead time" in production and inventory planning and control. What are the components of lead time? To what extent can lead time be managed?

PRO-XI--(5)----Describe and illustrate the following:

a) Acceptance sampling by attributes.

b) Acceptance sampling by variables

PRO-XI--(4)----Discuss the placement of Production Control in an organization having manufacturing and materials departments. Under which circumstances would it be most beneficial to have Production Control under either of the respective functions?

PRO-XI--(3)----The first unit requires 100 hours of labor and $1,000 of materials. There is an 80% learning curve on

labor and 90% learning curve on materials. What would be the direct costs of 8 units if labor is $10 per hour?

G. LOGISTICS MANAGEMENT QUESTIONS

LM--XIV-(7)----Describe and illustrate the application of an operations research/systems analysis method (i. e. queuing theory, inventory theory, linear programming, Monte Carlo, search theory, etc.) to the solution of a procurement management or systems acquisition problem.

LM--XIV-(2)----This company has three plants which produces the equipment at the same costs. It has orders for the identical equipment from X, Y, and Z, FOB destination. It is up to distribution management to decide the lowest routing pattern cost to fill these orders since transportation costs depend on the shipping point-destination combination and only one unit can be shipped from each plant. The shipping costs from each plant to the three customers are as follows:

Customers	Plant		
	1	2	3
X	$200	$300	$450
Y	250	400	320
Z	500	350	220

From which plants would you ship the three units to X, Y and Z to attain the lowest pattern cost?

LM--XIV-(3)----What is product support or provisioning, and what are some of the basic issues that must be resolved in determining how to support a piece of equipment?

LM--XIV-(8)----Explain and illustrate how the marketing function differs in marketing to government and in marketing to industrial customers. What are the similarities if any?

LM--XIII-(1)---Discuss the Economic Order Quantity (EOQ) model as a technique of inventory management. What is the general formulation of the model (what elements are included) and how is the formula employed to reduce costs?

LM--XIII-(1)---Briefly describe five functions performed by the traffic/transportation manager in a manufacturing firm.

LM--XIII-(9)---Many manufacturers follow a policy of market segmentation as one aspect of marketing strategy.

a) Explain the implementation of such a policy.

b) What social and economic factors provide the environment for market segmentation?

c) What limitations do you see in this strategy?

LM--XIII-(4)---What role should market research (by the purchasing activity such as the Federal Supply Service) play in determining the government's requirements, the type of contract to use, and how best to serve the customer agencies' needs?

LM--XII-(0)----Logistics management employs the term "customer service level". What are the main elements? Indicate the important characteristics of each. Give examples of standards of service. Is the concept of customer service level equally applicable in business sector logistics and public sector logistics?

LM--XII-(2)----What factors would you consider in determining whether to establish an in-house depot capability to maintain, repair or rehabilitate equipment as opposed to contractor services at the government facility or send the equipment to a contractor facility?

LM--XI--(2)----The details of logistics in a business varies with the type of business and how management perceives its scope and decisions included therein. However, there are functions which are common in all types of manufacturing to some degree. These are customer services, inventories, order processing and information systems, and transportation. Describe these functions and how they achieve an objective of management in successfully acquiring and maintaining a customer base in the market and a profitable return on investment.

LM--XI--(0)----As a logistics manager you should be concerned with the cost of goods from the time production finishes it to point of sale to the ultimate consumer and frequently beyond that to a limited degree where warranties apply. Identify the various costs involved in this process with a brief explanation of the contents of such costs.

LM--XI--(1)----Why is it advantageous to have a storage system and what are its two important functions?

LM--XI--(8)----The Huggy Bear Co. plans to produce 50,000 huggy bears and sell them for $5 each. If the company has a $50,000 fixed cost for such production run, and if variable costs are $3 per bear, how many bears must be sold to break even?

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